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JUNE 18, 1936

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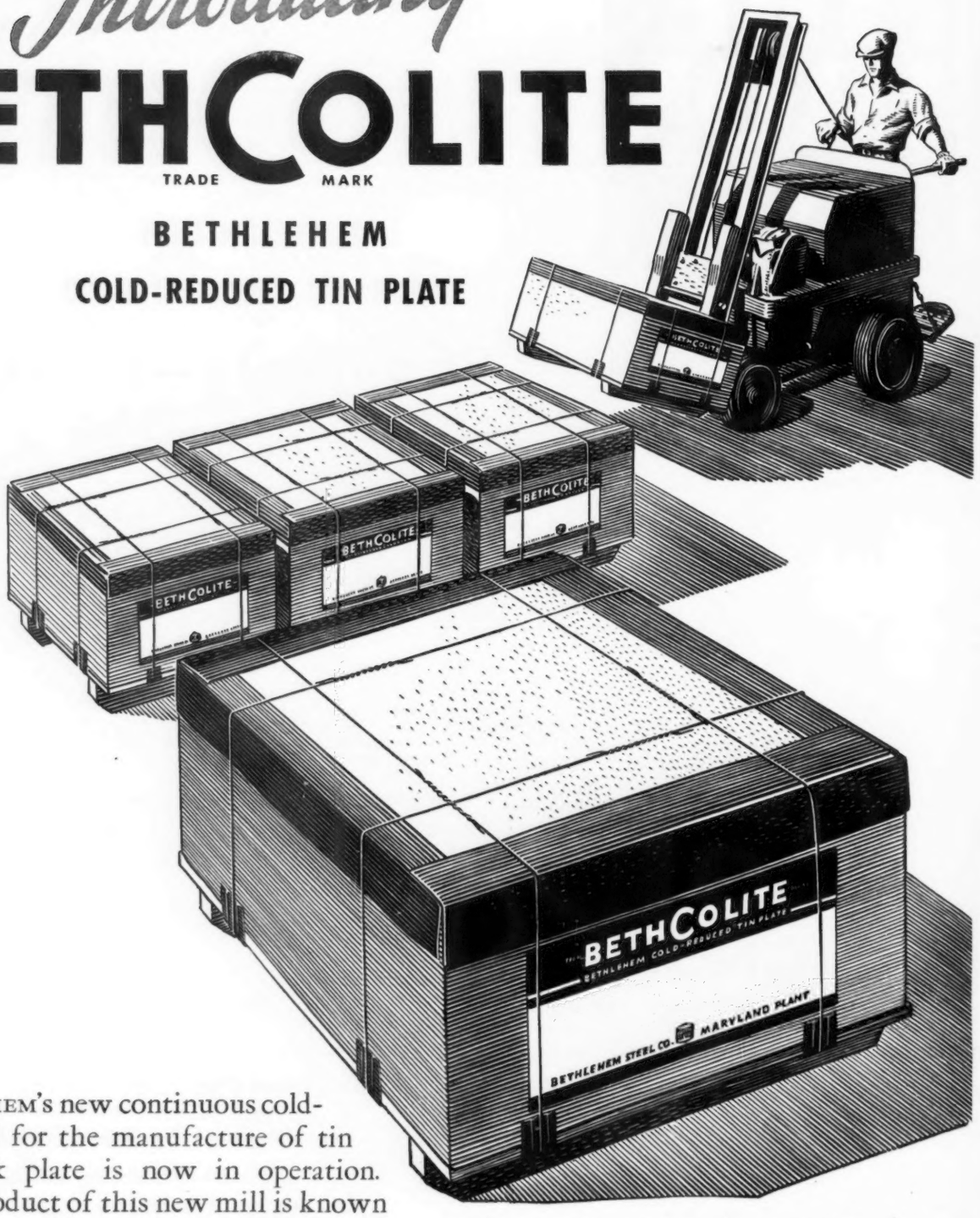

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JUNE 18, 1936

ESTABLISHED 1855 Vol. 136, No. 25

Little and Big Constitutions

IF some of our social theorists and New Dealers could have been at Middletown, Ohio, on June 6, on the occasion of "Verity Day," they might have learned something about a constitution, and what it does to promote industrial peace.

A constitution, as you know, is a bill of rights which defines the privileges of the governed and limits the powers of those who govern them. Years ago, George M. Verity and his associates in the American Rolling Mill Co. decided that a constitution for an industrial organization was just as essential as a constitution is for a liberty prizing people. So, utilizing the best thought of management and labor, they made one.

The Armco constitution is a living one, just as is the Constitution of the United States. It is subject to amendment through proper procedure as is our national Constitution. Each employee has a copy of it. Twice each year, every Armco worker is urged to read or reread his constitution so that he may understand his rights and obtain them.

That would be a good idea for Uncle Sam to adopt with his citizens.

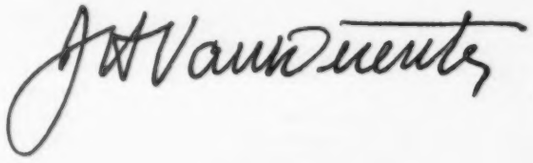
Middletown and its environs have become known as "Peaceful Valley." In its 36 years of activity, Armco has never experienced an interruption by labor trouble. And in the monster parade of men and women which so recently honored the first citizen of Middletown, the ranks of organized labor paid tribute to the chief executive of an "open shop."

Of course, this industrial peace in Armco has not come just from ***having*** a constitution. It has come from ***using*** it. It has been and is used, daily, by men and management in solving the problems which arise in management-employee relationships.

Employees of this company are not demanding, or seeking a "new deal" from its management. They know that their constitution insures them a square deal, which is much better and also more definite. It protects them from dictatorship and exploitation because it not only defines their rights but also limits the powers of those who govern their daily activities.

Because of having learned the value of a constitution by seeing it at work, the men and women of Middletown are in better position than most people to realize the protective value of our great national Constitution. You will not find many among them who would favor its nullification or agree with the Washington professors that it should be discarded in favor of a dictatorial manifesto.

More of these little constitutions in American industry would promote understanding and respect for our big Constitution.



Climax Molybdenum Co.

Modeling in the Foundry

Describing a Unique Use of To-Scale Pilot Castings to Solve a Difficult Production Problem—Also the Scope of the X-ray as a Foundry Tool

By T. W. LIPPERT
Metallurgical Editor, The Iron Age

A SOUND body beneath a rough skin! Such is the hope every foundryman sends along with each shipment of castings. Quite often the skin of his casting envelops a sturdy, perfect interior. And quite often the castings perform usefully and satisfactorily for many years, even though there is a hidden multitude of shrinkage cracks, blow holes, cracks, inclusions, etc. But much too often these defects show up on the buyer's lathe or quickly break down in service. In this latter case, the founder often suffers material loss and the reputation of castings as a dependable product is beclouded.

The inability of a founder confidently to guarantee sound castings has been the main factor contributing to the partial eclipse of the casting shop during the past decade. Internal qualities of rolled or forged metals have been more dependable and reproducible; consequently these two modes of fabrication so grew in favor for certain types of work that a few years ago castings were on the verge of being demoted to an unenviable secondary position.

Many founders have refused to recognize this loss of face, whereas others did recognize their disadvantage but did nothing about it other than the usual crossing of fingers as each lot of castings was shipped out. But certain more aggressive members of the foundry industry refused to accept semi-oblivion, and to this group the science of cast metals owes a debt of gratitude for a spectacular renaissance during the past several years. The foundry today is again a dominant factor in the industrial scene. It can turn out a complete cast railroad car, or a paper-thin cast alloy automobile piston, and a multitude of other products which can compete with other types of fabrication either on a performance basis or a price basis.

Much work has been done in the foundry to accomplish these ends. The role of impurities has become more fully recognized, new types of

alloys have been developed, heat treating has become a dependable art, and molding and melting techniques have been revamped. Even that old standby of the jobbing foundry, gray iron, has figuratively been given a new set of glands and now shows physical characteristics, surface finish and machining qualities far superior to its prototype of several years ago.

Foundry Difficulties

Despite these spectacular advances in the founding art, the average plant must still contend with (1) gas, slag and sand pockets due to loose dirt in the mold, (2) gas cavities due to imperfectly deoxidized metal, (3) sand inclusions due to cutting of the mold or runners, (4) pipe or primary shrinkage caused by failure of risers to function as intended, and (5) secondary shrinkage caused by bridging at constricted portions of the section.

This is a discouraging list of what could happen, but, fortunately, most plants have so standardized and controlled foundry practice that many of these faults are minimized. However, when a new job comes into the shop, the founder still has much occasion for worry. His molders must spot in a gate, scatter a few risers around where experience dictates, and, perhaps, tilt the mold this way and that during pouring. The hope is that innate ingenuity and past experience has enabled them either to entirely eliminate potential shrinkage cavities, flocculent shrink, blow-holes, cracks, and inclusions, or at least confine these defects to less significant sections.

Probably, on a new job of some importance the average founder will cast one or more pattern-size pilot castings and subsequently section them for visual examination or perhaps farm them out for radiographic inspection. If there is a concentration of defects in an important section, the usual procedure is to re-locate gates and risers, after which additional pilot castings are made. Quite a number of pilot castings are often made and examined before actual production is started on a new order. But if the castings involved should be large, it is obvious that a foundry cannot do very much destructive testing if it is to show a profit on the order.

One company, however, has pointed a way with an alternative which could be adopted by even the smallest plant. When a new job comes into the shop, instead of experimenting with several pilot castings full-scale to the pattern, its practice is to test a number of to-scale model castings. Optimum molding and casting practices can be established and these in turn can be transferred to the full-scale job. It is much more satisfactory to examine these to-scale models radiographically, although a small foundry could use destructive testing with moderate success.

There is no novelty in the use of full-size pilot castings, but the application of miniature, to-scale models is unique. The development of this technique opens up the way for more extensive experimentation with each production job; for the cost of metal and labor is very much lower than when a full-size pilot is tested, and radiographic inspection can be crowded on one 14 x 17-in. film, as compared with a multitude of exposures of limited area for a pattern-size casting.

Credit for the development of the technique of pilot casting belongs to Earnshaw Cook, research metallurgist for the American Brake Shoe & Foundry Co., and A. F. Burtt, radiographer for American Manganese Steel Co., a subsidiary. How these men used to-scale models to solve a particularly difficult production problem is the primary consideration of this article. Using these experiences as a model, any other foundry could achieve similar success on jobs which are giving trouble.

Castings Failed

One of the routine foundry jobs at the Amsco plant at Chicago Heights, Ill., is the casting of crusher liners from manganese steel. These liners are used by a large custom mill in equipment for crushing a very abrasive ore. The liners are shaped like the frustum of a hollow cone, and are quite large, measuring 7 ft. across the widest section and weighing in the neighborhood of 6900 lb. One of these liners is shown in Fig. 1. In actual use there is a smaller liner which fits inside and wabbles on an eccentric, thereby crushing the ore and separating the fines.

As cast, the liner wall averaged 3 to 4 in. in thickness, but after some months of service the wall wore down to a fraction of an inch. Although many liners gave satisfactory service, the users occasionally complained that certain mantles started to fail prematurely. This wearing was generally regularly distributed around the periphery of the shell, and was serious enough to necessitate scrapping even though considerable life remained in the mantle as a whole. For some time it was thought that there was some sort of harmonic motion in the machine which caused the mantle to fail at regularly distributed points.

It will be noticed that there are six points of failure in the mantle shown in Fig. 1. The six failures and their location soon led to the correlation of these weak areas with the six risers used when the mantle was cast. Subsequent investigation in the foundry showed that there were excessive shrinkage areas under each of the six heads, and, furthermore, this shrinkage was concentrated in the outer fibers of the mantle. Since maximum stress during operation of the crusher is in the outer metal fibers, rapid localized failure was the inevitable result.

The foundry was faced with the necessity of immediately changing casting practice so that shrinkage areas would be eliminated or confined to unimportant sections. Long-range experimentation with pattern-size pilot castings was out of the question because of the labor and metal expense involved and the exorbitant cost of completely radiographing the large areas.

It was then decided to use to-scale models. Many miniature castings could be made and these could incorporate every conceivable casting practice. They all could be poured from the same heat of

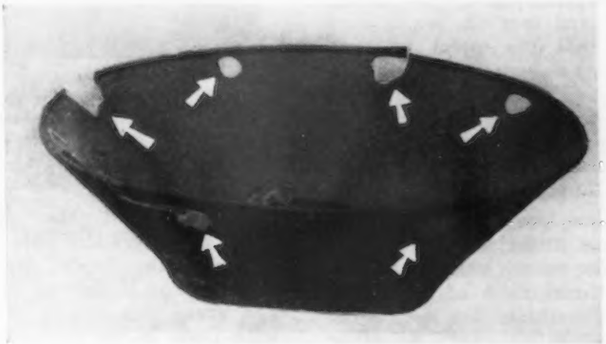


FIG. 1—Six points of failure. This 7-ft. mantle used for crushing ore has worn down to 1/8 in. to 1/2 in. thick. The six points which failed first correspond to the location of the six risers used during the casting of the mantle.

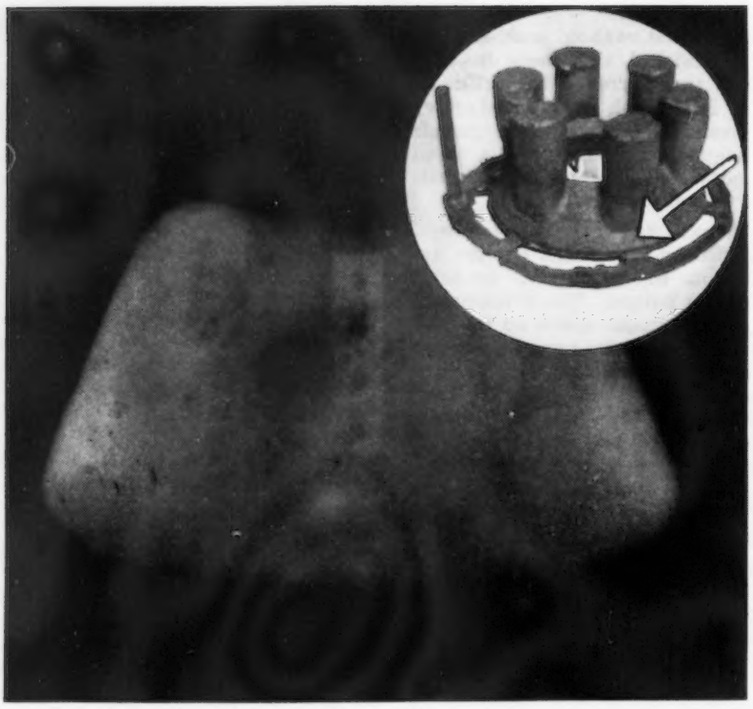


FIG. 2—This miniature casting (inset) measures 14 in. across and was cast under identically the same conditions as the full-size mantle in Fig. 1. The radiograph was taken at the point designated by the arrow. Note the large shrinkage cavity, which is considerably darker than the 0.1-in. step in the penetrameter faintly visible in the radiograph.

metal, thereby minimizing experimental errors, and, also, each casting could be diagnosed radiographically on one film.

First, Amsco made up a to-scale model of the liner which had failed. This is shown in Fig. 2. Over-all dimensions were scaled down on the basis of 1 to 6, making the pilot casting only 14 in. across at the widest section and having a gross weight of about 100 lb. It is important to point out, however, that in pouring the to-scale model, it was found that the walls were so thin that the metal froze so quickly that no concentrated shrinkage occurred. It then became necessary to increase the wall thickness of the model casting to duplicate the solidification lines of the full-size mantle.

Therefore, the model shown in Fig. 2 is a distorted miniature of the full-size mantle casting, having a proportional ratio of 1 to 6 in over-all dimensions but a ratio of 1 to 3 in wall thickness. All other casting practices were identical, that is, the model was poured flat using one gate and an annular feeder and six risers distributed equally around the periphery. After the risers and gate had been removed, the model was radiographed and it showed six shrinkage areas comparable in position with those in the full-size casting.

The next step was to pour a great number of model castings covering numerous variations of foundry technique. All together, about 25 such castings were made and examined. One had two interconnected gates and two risers, another was poured in an inverted position and had six risers, another had two risers connected with the gate and two risers at the opposite side, and still another used a partial ring with the gate and only one riser. Chills were used in a number of cases, some were cast flat, others were cast at a 25-deg. angle, and a few were 10 deg. off the horizontal during pouring but were shifted 10 deg. in the opposite direction when the mold had filled.

Of these many varieties only a few will be detailed and compared. In the table (see page 98), full casting data and radiographic results are given for six different to-scale models, and Figs. 2 to 5 show actual photos of two of these models as well as a radiographic view of a segment in each case. The casting in Fig. 2 (No. 3 in the table) was the original practice—note that there is an area of considerable shrinkage under the one head, and there are similar areas under each of the other heads. The casting in Fig. 5 (No. 13 in the table) was the final practice adopted. *There was no shrinkage, the yield of metal was increased by over 100 per cent and foundry practice was greatly simplified.* Only one head was used and the mold was poured at a 10-deg. tilt and then shifted 10 deg. in

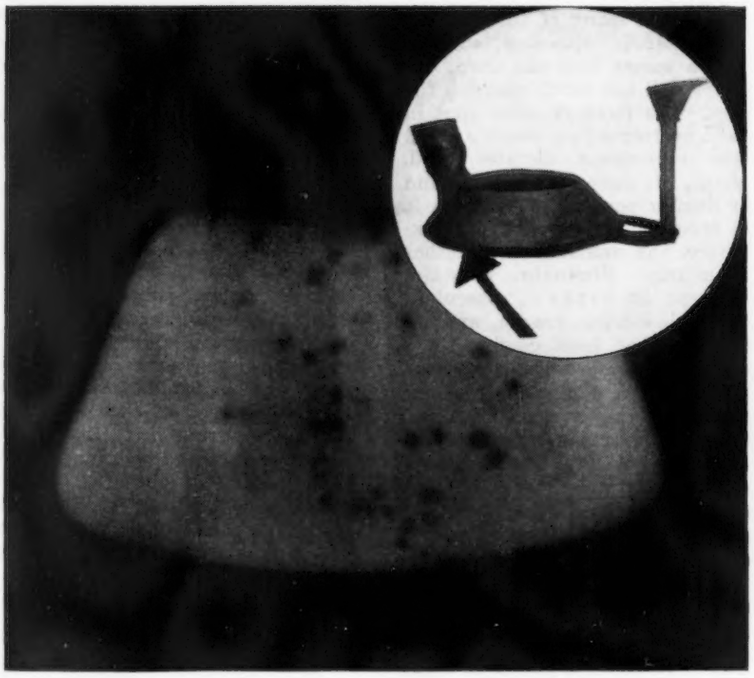


FIG. 3—Another miniature casting, using one riser opposite the gate. This is not the optimum casting practice; for the radiograph shows considerable porosity and blowholes under the head.

the opposite direction. The angular feeder and five additional heads used in the original practice were completely eliminated.

Furthermore, when the technique used in Casting No. 13 (Fig. 5) was incorporated in a full-size model, none of these advantages were lost. The full-size mantle was poured with only one gate, and the 10-deg. shift each side of the horizontal during and after pouring was accomplished by means of a crane or hydraulic jack. In service these mantles showed no tendency to fail rapidly in particular sections. The complete mantle wore down uniformly, and users were pleased with the much longer life of each installation.

Consideration of all of these casting practices, and, specifically, the excellent results obtained with Casting No. 13 illustrate the importance of directional solidification. The series of experiments proceeds from the original casting practice (Casting No. 3) having a surplus collection of ineffective

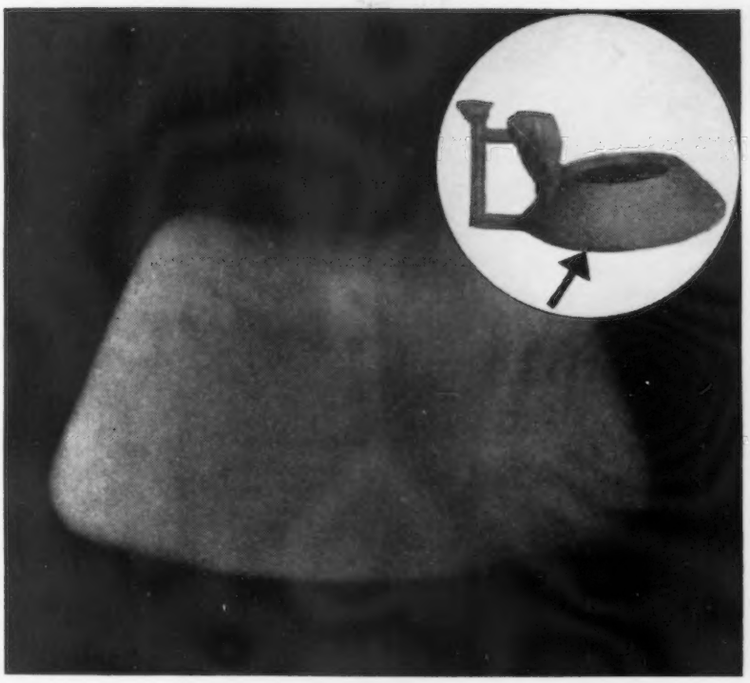


FIG. 5—The radiograph shows that this miniature casting is sound. One head connected with the gate is used, and, by tilting, the metal solidification approaches the ideal of free shrinkage which is obtained by feeding from the last and hotter metal poured. Excellent results were obtained when the practices developed on this model were transferred to a full-size casting.

FIG. 4—A miniature casting using two risers and two gates. The spreading cavity shown in the radiograph is proof that this practice is undesirable. The arrow indicates the location of the radiograph.

heads and a yield of 38.5 per cent, through an approximation of the preferential lines imposed by chilling (yield of 59.7 per cent—Casting No. 6 in the table), to the ideal condition of free shrinkage obtained by feeding from the last and hotter metal poured (yield of 77.7 per cent—Casting No. 13 in the table). As stated before, the transfer of this latter practice to full-scale production was accompanied by eminently satisfactory improvement in internal qualities and foundry yields.

Advantage of X-rays

The results obtained are a practical demonstration of how miniature to-scale casting can be used to develop a superior casting and, incidentally, simplify foundry practice and improve the metal yield to an amazing degree. The scope of this investigation would have been utterly impractical if full-size pilot castings had been used, inasmuch as the metal, labor and radiographic costs would have been prohibitive. Even the smallest jobbing foundry could find it advantageous to experiment in the same manner when an order calling for a number of duplicate castings is received. Instead of radiographic inspection of the to-scale models, it would be feasible to break them down for visual inspection. But there is no doubt that radiographic control would be the more advantageous.

Undoubtedly, a satisfactory X-ray installation is beyond the financial reach of smaller founders, but even many of the larger melters have still resisted the self-evident competitive advantage in being able to cooperate with buyers in turning out superior work by means of radiographic control. If such equipment cannot be squeezed into the budget, it would probably be profitable for most foundries, both large and small, to occasionally rent a capsule of radium for the inspection of a specific job. Gamma-ray technique is much simpler than X-ray; it can be learned

(CONTINUED ON PAGE 98)

MOVING stairway of aluminum in the Chicago store of Sears, Roebuck & Co. have been finished by the Alumilite process. Aluminum Co. of America photo.

Coloring of Metals

(3) White Metals

o o o

By HERBERT R. SIMONDS and C. B. YOUNG

o o o

ALUMINUM is one of the "big four" among metals and, from the point of view of color, it ranks next to copper. Aluminum takes a plate and can be plated onto other metals so that much that has been said about plating for color and about the coloring of electrodeposited coatings in the previous articles in this series applies also to aluminum.

Heat-treating has little to do with the coloring of any of the non-ferrous metals. Also, alloying, which seemed to be important for copper and brass, has relatively little color importance for most of the white metals except as they are alloyed with copper, in which case the coloring processes are those which were described in a previous article in this series. Plating and chemical treatment therefore constitute the chief methods of coloring the white metals. Aluminum, while lacking color and appearance value as cast or rolled, is one of the best of metals for coloring and for giving different surface textures.

Coloring of Aluminum

A dead white coating may be produced on aluminum by boiling the parts in lime mixed with a little calcium sulphate. The solution is held at 185 deg. F. and is made with 10 grams of calcium oxide and 10 grams of calcium sulphate to 1 liter of solution. In the use of this method, care must be taken to remove the solution daily and to agitate the bath to prevent settling. The method is flexible and the thickness of coating depends on time of immersion. The times required to produce different thicknesses of coating are as follow: 0.0010 in. in 10 min.; 0.0017 in. in 15 min.; 0.0018 in. in 30 min.; 0.0020 in. in 60 min.; and 0.0024 in. in 240 min.

Coatings produced in this manner have the following chemical analysis: Aluminum oxide, 53.7 per cent; calcium sulphate, 14.0 per cent; aluminum sulphate, 03.3 per cent; and water, 29.0 per cent.

While the above method gives a dead white on pure aluminum, it shades off to gray on many of the aluminum alloys. The coating, however, on pure aluminum is fine grained and remarkably adherent. In fact, strip aluminum may be coated in this manner and then bent without causing any cracking or separation of the surface. The abrasion resistance, however, is low.

A yellow gold color with a grayish tinge is produced on aluminum by immersing the parts in a solution containing 2 per cent potassium permanganate and 0.5 per cent copper sulphate. This solution

should be kept at from 180 to 190 deg. F. and about 20 min. is required for the process.

A yellow red surface is produced by immersing aluminum parts in a solution of 2.5 per cent potassium sulphide, 0.1 per cent alizarine, and 0.1 per cent morine. This also should be held at from 180 to 190 deg. F., and the immersion time is 20 min. A yellow gold with a light silver tint is produced with a solution of 2.5 per cent potassium sulphide, 0.1 per cent morine, and a trace of alizarine. In this case the result is secured more quickly and some manufacturers have found 10 min. immersion sufficient. The temperature, as with the previous solutions, is held at from 180 to 190 deg. F.

Seldom is an iron color desired on aluminum, but sometimes such a color is desired in order to give a special effect or to match surroundings. A uniform although dull iron color may easily be secured by immersing aluminum in a solution of 2.5 per cent potassium sulphide and 0.1 per cent vanadium sulphide. A solution of 2.5 per cent potassium sulphide with 0.1 per cent morine will give aluminum an interesting bronze color. The solution is usually held at from 180 to 190 deg. F. and it takes ½ hr. immersion to get the full effect.

Permanence of Finish

Some of the interesting surface effects on aluminum are subject to tarnishing and thus the various processes must be selected with the exposure conditions in mind. Some excellent clear lacquers have been developed for protecting colored aluminum surfaces. When conditions call for outside exposure of the uncoated metal most of the bright colors are unsuitable.

A stable velvety gray color may be obtained by immersing aluminum and aluminum alloy parts in a boiling solution containing 100 grams of di-ammonium phosphate and 5 grams of manganese nitrate to 1 liter of solution.

Sand blasting is frequently employed for producing stable surface appearance and many times it is found more satisfactory than pickling.

Some interesting methods of producing deep shades on aluminum have been developed recently, and undoubtedly the possibilities in this direction are very great. A solution of 10 to 20 grams of ammonium molybdenate and 5 to 20 grams of sodium acetate, with a small amount of ammonium chloride per 1 gal. of water, will give a deep black color to aluminum parts in about 1 min. of immersion time. Care must be taken after coloring to thoroughly wash, in order to remove any traces of chloride.

Another method of securing black on aluminum is to dip the parts in a solution containing from 5 to 10 grams of potassium permanganate from 2 to 4 c.c. of HNC_3 of 1.35 specific gravity, and 20 to 25 grams of copper nitrate to 1 liter of solution. A slight modification of this solution will give a brown color. One method is to increase the copper nitrate to about 30 grams and heat the solution to 180 deg. F. A range of browns then may be secured by varying the time of immersion. A deep brown is secured in from 10 to 15 min.

Aluminum may be etched with any one of several acid solutions to give an interesting matte surface. Also, the anodizing process gives an attractive color and texture and furnishes an excellent base for producing a wide range of colors by the alumilite method.

Anodizing Aluminum

Aluminum coloring by the process of creating colored compounds on the surface is impossible because the compounds of aluminum are colorless. However, an aluminum oxide finish may be produced and this in turn may be colored almost any hue desired.

The commercial methods for producing an oxide finish on aluminum fall into three groups: (1) Chromic acid group, (2) sulphuric acid group, (3) oxalic acid group.

The chromic acid method gives films which are more or less opaque and produce on the pure metal a pearly gray color. These films are resistant to corrosion attack, but

---

METHODS of coloring iron and steel and their alloys and of coloring copper and its alloys were described in the first two articles of this series, which appeared March 26 and April 16 respectively. This article considers most of the industrially important "white metals" except zinc. Specifically, it describes the coloring of aluminum, cadmium, chromium, lead, platinum, rhenium, rhodium and silver.

The next article of this series will describe the coloring of zinc and the fifth article will discuss metal coloring costs and other commercial considerations.

Mr. Simonds is vice-president of Metal Products Exhibits, Inc., Rockefeller Center, New York. Dr. Young, associated with Dr. Colin G. Fink at Columbia University as an instructor in chemical engineering, is the technical director of the United States Research Corp., Long Island City, N. Y.

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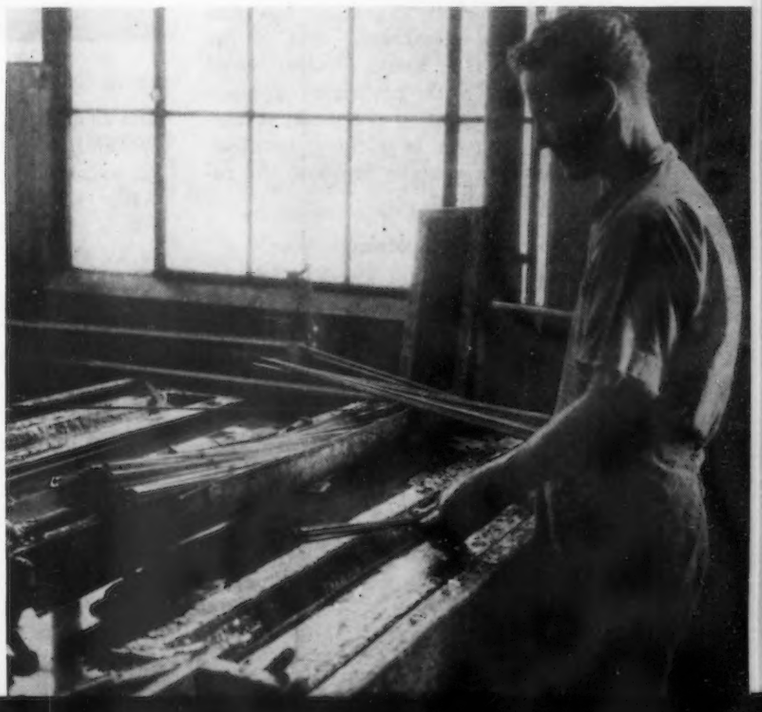

THIS worker is coloring aluminum alloy tubes which will be used for fishing rods.

o o o

the operation requires special equipment, control, and lengthy batch operation. The resistance to abrasion increases with age.

The sulphuric acid method produces practically colorless and transparent coatings, and in the freshly formed condition these are rather harder than the chromic acid deposits. Also, the process is relatively inexpensive to operate, requires little special equipment, and the time of operation is short. The oxalic acid films are nearly transparent, with a slightly yellow tinge, and the hardness may be varied from extreme brittleness to soft and flexible films.

When all conditions are taken into account it is seen that the second method, which makes use of a sulphate film, is by far the most important commercially and it is this method which will be considered in some detail here.

Whenever aluminum is made the anode in an electrolyte of dilute sulphuric acid containing small amounts of chemicals to prevent etching, and a current of 15 to 20 amp. per sq. ft. is passed through it, an oxide film is produced on the metal. In practical operation the time is 15 to 20 min., using a temperature of 68 to 86 deg. F. The acid concentration of the bath may be varied between 10 to 75 per cent and it is possible, by the proper selection of conditions such as temperature, current density, time of treatment, voltage, metal or alloy used, and acid concentration, to produce coatings which will be an integral part of the metal and which will not chip, and yet will be hard as chromium.

The thickness of the coatings varies from 0.0003 in. to 0.001 in., depending upon the procedure. The light reflectivity of the coating is approximately 10 per cent less than the pure aluminum. One of the authors (Dr. Young) has produced coatings with attractive appearance by cleaning the metal in certain types of etching solutions which incidentally increase the reflecting power.

Coloring

After the oxide coating has been created it is then possible to color the film by dipping the parts in aqueous solutions of organic dyes. It is essential that the dyeing be done immediately after the coating has been produced and washed, for if the coating is allowed to dry, the pores absorb the surrounding air, thus preventing the dyes from penetrating the film. The dyes are believed to form "lakes" with the coating. When these compounds are formed, being insoluble, they are precipitated in the interstices of the coating.

The dyes used are generally acid in nature and soluble in water. The temperatures of these solutions vary from 68 to 180 deg. F. The colored films thus produced are organic, and therefore are not stable. This has proven to be a handicap, as the finish generally loses its attraction in from 12 to 18 months. For this reason inorganic colored materials have been used with more promising results.

Dr. Young also has produced several inorganic colored coatings, using the anodized aluminum as a base. This consisted of anodizing the metal in coloral (an anodizing solution produced by the U. S. Research Corp., Long Island City) and then submerging in a solution containing 50 to 100 grams of ferric sulphate in 1 liter of solution. After remaining in the solution, which is kept at 212 deg. F. for 5 to 10 min., it is removed, washed in warm water, and placed in a saturated solution containing 60 to 80 grams of potassium ferrocyanide in 1 liter of solution for 5 min. After removing, the coating is rinsed in warm water. By this method the ferric ion, which is dissolved in the pores of the anodized coating, unites with the ferrocyanide ion, producing the well known blue compound, potassium ferrocyanide. This compound is a pigment which produces a very neat shade of blue which is unaffected by sunlight.

Some methods of coloring aluminum are the same as those used for zinc, and they will be described in a later article. However, one or two of the methods common to several alloys will be considered briefly here. Most any of the alloys of aluminum, cadmium, tin and zinc may be colored by immersion first in a solution of ammonium molybdenate which is kept alkaline by addition of ammonia. The solutions usually contain 5 to 20 grams of ammonium molybdenate in 1 liter of solution.

After brief immersion in this first solution, a second solution is used, made up by adding to the first solution from 2½ to 10 grams of sodium thiosulphate. Immersion in this second solution is for a somewhat longer interval. For success with aluminum a small amount of chloride is frequently added. The resultant color on most of the alloys is a slightly irridescent brown. Some of them have gray tones. Zinc by this process becomes black. Iron assumes a fine dark brown color.

Additional color effects may be secured by passing an electric current through the second solution at the time of dipping. Aluminum occasionally is colored by alloying, as

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CHROMIUM-plated food containers have been attractively colored to harmonize with their surroundings.

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previously described. An excellent imitation gold alloy has 93 per cent copper and 7 per cent aluminum, with small additions, generally less than 1 per cent, of nickel, gold and iron.

Alloys of iron containing small amounts of aluminum may be colored blue by a treatment with a sodium hyposulphite solution. This solution consists of 1 oz. of sodium hyposulphite dissolved in 1 gal. of water to which is added 1 oz. of lead acetate mixed in 1 gal. of water. The solution is heated to 197 deg. F., and it gives a lead sulphite coating onto the immersed parts. Color varies with time of immersion. An excellent black finish on aluminum is produced with ammonium molybdenate 2 oz., ammonium hydroxide (30 per cent) 2 oz., and water 1 gal. This solution is used with an electric current of from 15 to 20 amp. per sq. ft. at 5 volts. The solution is held between 60 and 70 deg. F. and a ratio of approximately 2 to 1 should be kept between the anode and the cathode. Anodes are usually sheet steel.

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ALUMINUM and other white metals are colored for the protection and decoration of a multitude of products, of which this furnace is one of the most interesting.

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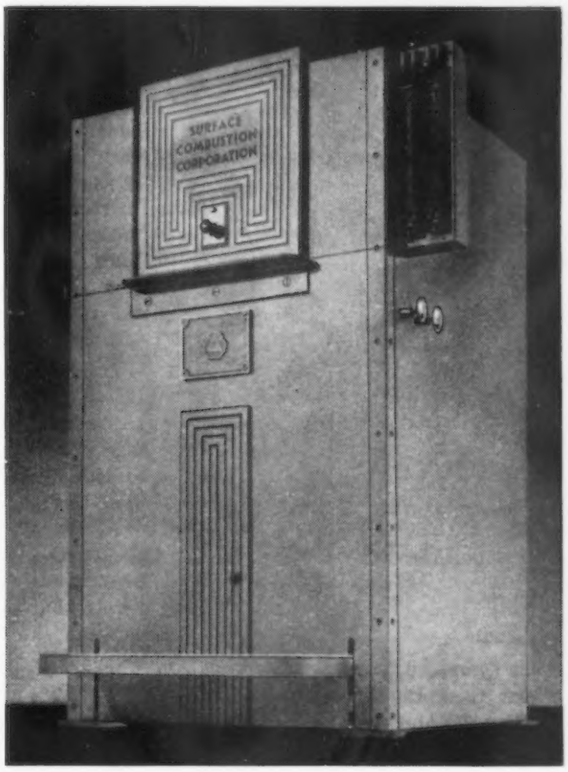


Coloring of Cadmium

Cadmium has an attractive natural color somewhat like zinc, but under similar conditions cadmium will not tarnish as readily, and, therefore, in years past it has had quite a vogue as an electrodeposited coating for steel and other base metals. This subject has been covered in other articles and as the present price of cadmium is high, due to its use as a constituent of bearing alloys in the automobile industry, its importance in coloring is not very great. The high price of cadmium is having the effect of stimulating the use of electrodeposited zinc coatings and many new processes for producing fine grained bright zinc coatings have been developed. These will be described more fully in the next article under the heading of zinc.

Cadmium and zinc are closely related metals and one may usually be substituted for the other either in plating or alloying. For instance, cadmium may be substituted for zinc in nearly all of the zinc alloys, and bronzes made from cadmium are claimed to have some distinguishing features. In fact the bearings now popular in automobiles are essentially cadmium bronzes.

One of the usual baths employed for coloring cadmium consists of potassium chlorate, 6 grams; and copper sulphate, 25 to 35 grams in 1 liter of solution. The cadmium parts should be thoroughly cleaned, and care should be taken to add copper sulphate as the process continues, for copper is precipitated out of the solution continually. On the other hand, care must be taken not to have the copper sulphate content excessive. Usually it is added in quantities of not more than 2 grams to 1 liter. The results vary, due to time of immersion and concentration, and the color may be graded from deep black to old silver. A good black on cadmium is produced with 6 grams of potassium chlorate, 5 to 8 grams of copper chloride to 1 liter of solution. This varies from the previous method in that chloride has been substituted for sulphate.

Several good browns may be produced on cadmium, but because of the diminishing use of this metal in the finishing field, these will be touched on but briefly.

A concentrated hot solution of sodium thioantimonate will produce excellent brown tints on cadmium. Some experimenting with this solution will develop a variety of interesting colors. Another solution for brown on cadmium consists of 30 grams of copper nitrate and 2½ grams of potassium permanganate to 1 liter of solution. This is used at about 180 deg. F.

Chromium and Rhodium

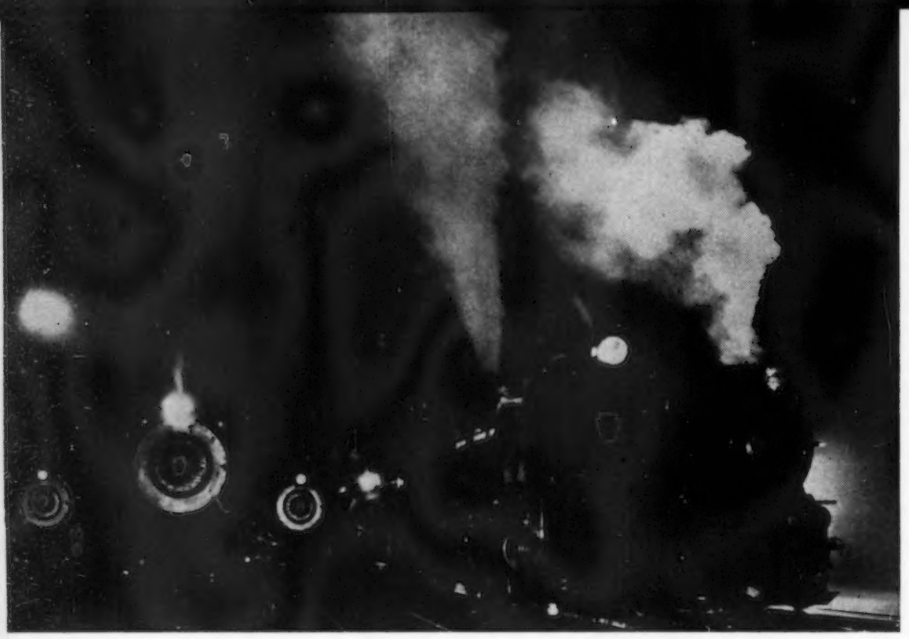
The information on methods of coloring chromium is meager, and further research work is very definitely needed in this field. A satisfactory black color is produced chemically, as described in the first article in this series in connection with chromium plating steel.

Chromium and chromium alloys, of course, are becoming increasingly important for their color or appearance value. In general, chromium is a difficult metal to coat or color. It has the peculiar property of resisting wetness, that is, water doesn't seem to wet the metal surface or at least is slow to wet it.

However, with care it is possible to successfully plate all of the regular platable metals onto chromium. Several manufacturers are now turning out satisfactory chromium steel watch cases which are gold plated. This is a somewhat tricky job and for success depends upon first destroying the passive

(CONTINUED ON PAGE 99)

BETTER RA



Pennsylvania Railroad

Generally: *A Résumé of Recent Advances in the Manufacture of Rails, Which Ended Transverse Fissure Trouble.*

More Specifically: *Bethlehem Steel Co.'s Rail Heat-Treating Procedure and Method of Reducing End Batter.*

FIFTY years ago railroads experienced very little trouble with rails. They were interested principally in wear. There was no cause for apprehension on account of breakage, since the weight of the rail was far in excess of that necessary for the light-wheel loads and low speeds.

This condition has been responsible for the statement that is frequently heard today that "old time rails were better than those now produced." This is an unjustifiable conclusion based upon lack of appreciation of the much greater severity of the conditions that modern rails must meet.

Rails have increased in weight. A 131-lb. rail is currently in common use, as compared with a 100-lb. rail which was the maximum 50 years ago. This 31 per cent increase in weight, however, is much more than offset by a 100 per cent increase in static wheel loads combined with higher speeds, which raise the dynamic loads to measured values of twice that of the static loads. Consequently there is now a far greater pressure of the wheel on the rail and this is confined to an area of contact only slightly larger than under the old conditions.

The result has been *an increase not only in wear but in the number of rail failures.* The first type of failure occurring in large numbers was the split head. This was mainly confined to rails rolled from the top of an ingot. These failures were troublesome, but they generally developed gradually and in plain sight of inspectors and were generally removed before they became dangerous. As these split heads increased under the growing severity of traffic, railroads objected strenuously. However, the railroads were more annoyed than they were alarmed.

They were alarmed, however, by a wreck which occurred in 1911 at Manchester on the Lehigh Valley Railroad and which was traced to a broken rail. An examination of this rail showed that the breakage had taken place as a result of an internal transverse rupture during service which had gradually developed within the rail head without any external indications of failure. This marked a new phenomenon in rail failures which is now commonly known as the transverse fissure. In recent years transverse fissures, more through their insidiousness than through their frequency, have been the cause of more concern to the rail maker and rail user than all other types of rail failures.

Much thought has been given to transverse fissures. What causes the disease? What is the cure? The last word has not yet been said as to the cause, but much has been done in the way of a cure.

Nearly 10 years ago, Messrs. Sandberg of London, England, internationally known rail engineers, pointed out the probable connection between shatter cracks and transverse fissures. According to the Sandbergs the shatter cracks, which occur occasionally in rails "as rolled" may act as the foci from which transverse fissures gradually develop within the heads of rails during service. According to the Sandbergs, "one of the chief causes" of shatter cracks are stresses caused by "a substantial difference of temperature during cooling between the outside metal and the interior metal, more particularly of the big mass in the head of the rail."

Shatter Cracks Prevented

They believed that if the occurrence of shatter cracks could be prevented the transverse fissure problem would be solved. Accordingly, they instituted an exhaustive series of experiments in this direction. Before the end of 1928 they had developed a method of controlled-cooling at the Cargo Fleet Iron & Steel Works at Middlesbrough, England, which effec-

ER RAILS *for the* IRON HORSE

tively prevented the occurrence of shatter cracks. In the succeeding year they introduced this method into the United States, where, after a period of several years' experimentation on the higher carbon American rail by the Bethlehem Steel Co., the process was adopted by Bethlehem on a commercial scale. More recently the method has been adopted by Inland Steel Co. and the Colorado Fuel & Iron Co.

last-mentioned company is subjecting its entire output of rails to controlled-cooling.

The ideas and practices of the Sandbergs, Gerhardt and Mackie have been confirmed in essentials by recent scientific investigation. The work, for example, conducted at the University of Illinois, under the auspices of the Association of American Railroads and the Rail Manufacturers' Technical Committee, is especially significant.

In this work at the University of Illinois, equipment was used to subject rails, under laboratory control, to conditions simulating those of actual service and thus to develop transverse fissures in those rails having susceptibility thereto. "Tests of rails under rolling loads" in this equipment "have yielded fairly convincing evidence that fissures in rails usually originated at shatter cracks which formed in the rails during the process of manufacture. All laboratory-developed fissures were in shatter-cracked rails and about 75 per cent of the service-fissured rails sent to the investigation showed evidence of shatter cracks outside the main fissure." (American Railway Engineering Association Bulletin No. 376, June 1, 1935.)

From the above-mentioned bulletin it also appears that the University of Illinois made comparative tests of hot-bed cooled and controlled-cooled rails from four different mills and that while some of the hot-bed cooled rails had shatter cracks and developed internal fissures when subjected to

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CLOSE-UP view of a mitred rail. Photo by Bethlehem.

BELOW

CLOSE-UP view of an insulated mitred rail joint. Photo by Bethlehem.

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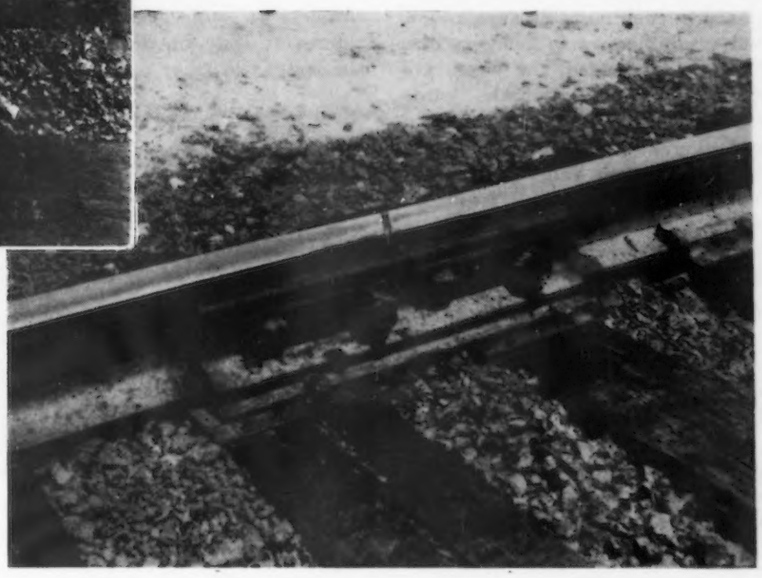


Other investigators, Gerhardt of the Bethlehem Steel Co. and Mackie of the Dominion Steel & Coal Corp., Ltd., of Sydney, Nova Scotia, likewise diagnosed shatter cracks as the principal cause for transverse fissures and, like the Sandbergs, found the cure of shatter cracks in the controlled cooling of rails. At the present time the

rolling load tests none of the controlled-cooled rails had shatter cracks or manifested internal fissures when subjected to such tests.

Not all the rails cooled in the usual way on the hot-bed contain shatter cracks. It is known that only a very small percentage of the rails rolled contain shatter cracks, and even in those rails the number of shatter cracks is small. But their occurrence is insidious. Shatter cracks are sometimes found in rails produced from a particular ingot of a heat and absent from other ingots of the same heat. A limited portion of a rail is sometimes found to contain a few shatter cracks while the rest of the rail is entirely free from them. Obviously there can be no real assurance of freedom from shatter cracks unless all rails are subjected to the controlled cooling operation. Without vaccination the majority of human beings might not have smallpox, yet universal vaccination is the only sound prophylaxis.

Over five years of experimentation was necessary to determine just the conditions requisite for controlled cooling of American rails, and to develop the process on a commercially effective scale. As applied at the mills of the Bethlehem Steel Co., for example, the practice in its broader aspects may be outlined as follows:

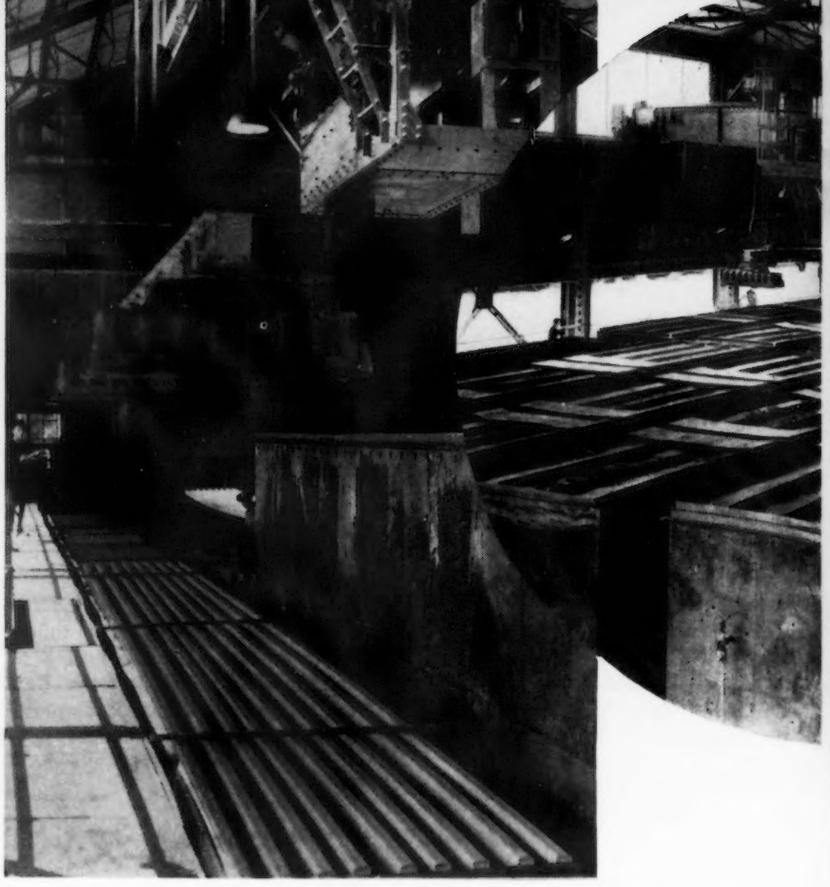
Bethlehem's Process

The rails are cooled on the hot-bed in the usual manner until the temperature has dropped as low as 1000 deg. F. but not less than 932 deg. F. They are then placed in boxes or tanks for slow cooling, a sufficient number of rails being placed in each box to insure a slow and gradual drop in temperature. After being loaded, the boxes are carefully covered, and the joints are made sufficiently tight to avoid cool currents of air coming into contact with the rails. Moreover, the boxes are protected from exposure to snow and rain. The rails remain in the boxes or tanks until their temperature has dropped below 400 deg. F.

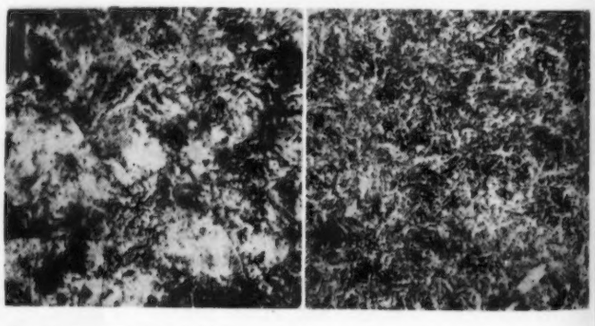
Practical experience, as well as extensive laboratory experimentation, has indicated the importance of starting the controlled cooling at a sufficiently elevated temperature, but, of course, below the transformation range and to continue the retarded cooling to a temperature below 400 deg. F. There has been some difference in opinion among investigators as to within what ranges of temperature, during cooling, rail steel is most susceptible to the formation of shatter cracks. The Sandbergs, for example, inclined to the belief that the tendency to shatter cracks was greater between 932 deg. F. and 650 deg. F., while Gerhardt and Mackie had the view that the tendency to shatter cracks was greatest below 650 deg. F. Both the Sandbergs and Gerhardt agreed, however, that in practice it was important to start at a sufficiently elevated temperature to allow a substantial margin of safety.

Mackie, in describing an application of his process which was "100 per cent effective in eliminating all traces of shatter cracks," stated that the rails were allowed to cool normally on the hot-bed until visible redness in a dim light had disappeared, and then were placed in the cooling tank as promptly as practicable.

Apart from the prevention of shatter cracks, the controlled cooling substantially reduces the residual stresses in the rails, thereby



RAILS are permitted to cool on the hot-bed to about 1000 deg. F., as shown in the photo and, finally, covers are sealed on the boxes and the rails cool to about



PHOTOMICROGRAPHS of the structure of treated and diameters, heat-treated rail at 100 diameters, untreated rail by Beth

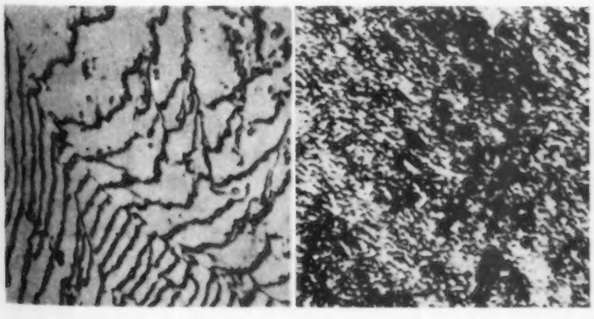
on the left; two magnets on a yoke transfer the rails to a cooling box, as shown in the middle, 400 deg. F., as shown on the right. Photos supplied by Bethlehem Steel Co.

greatly minimizing the tendency to the development of weaknesses in the rail, other than transverse fissures, during service. The controlled-cooled rails show substantially higher results in bend tests than ordinary hot-bed cooled rails. The ductility is better. All these results are obtained without appreciably affecting the hardness of the rail as determined by laboratory tests as well as by measurements of the wear of the rails in track.

The production of controlled-cooled rails in Europe has reached the figure of approximately 1,000,000 tons and the production of such rails in the United States and Canada now aggregates about 385,000 tons.

Rail Heat Treatment

In the efforts to meet the increasing need for rails of higher physical characteristics, substantial advances have been made through heat treatment. The term "heat treatment" is here used because of its general acceptance in the industry, instead of the more accurate, but also somewhat more cumbersome, expression, "quenching and tempering."



untreated rails: From left to right, untreated rail at 100 at 2500 diameters, and heat-treated rail at 3000 diameters. Photos lehem.

When the demand for rails capable of greater and greater loads first appeared, metallurgists naturally began to consider the feasibility of applying to rails the well-known effects of quenching steel in greatly increasing the hardness and strength. Some 30 years ago various methods of heat treating rails began to appear in the technical journals and patents.

It was soon discovered, however, that the problem was not simple. The usual methods of heat treating steel articles could not be successfully applied to rails.

A rail offers certain special obstacles to ordinary quenching operations. Its peculiar cross-section with its unequal distribution of metal, its great length, the great mass of metal, particularly in the head, and the high carbon content, all contribute to the difficulty of effective, yet safe, quenching.

For years attempts were made to solve the problem with but indifferent success. All of the ordinary methods developed stresses sufficiently great to cause ruptures in the metal, particularly within the interior of the head.

After a period of experimentation lasting some 20 years, Edward F. Kenney, of the Bethlehem Steel Co., discovered a process of preventing these ruptures, which is described in United States Reissue Patent No. 17,240. The practical embodiment of the Kenney process as it has been practiced by the Bethlehem Steel Co. involves quenching the rail while cooling from mill heat, discontinuing the quench at a definite temperature promptly effecting equalization at an elevated temperature and finally subjecting the rail to controlled cooling.

This treatment is exceedingly important. The present trend is decidedly in the direction of higher speeds in train service. Under the higher speeds on tracks today, the dynamic wheel load sometimes exceeds 100,000 lb. At times nearly all of the enormous axle load on a pair of wheels is concentrated on a single wheel. The entire braking effect at high speed may be applied on a small area of contact between one wheel and the rail amounting to only from 1/3 to 1/2 a square inch. Under these concentrated loads the surface metal of the rail tends to flow. This tendency to flow is opposed by the underlying metal, thereby resulting

in great tensile stresses of the interior metal. With the high speeds of today the need for high physical characteristics of rails is great; with the prospective, and probable, higher speeds of the near future, the need will be imperative. Heat treatment of rails effectively meets this need.

A study of the accompanying chart and photomicrographs, giving the comparative physical properties and structure of treated and untreated rails, will plainly indicate why the treated rails are far superior in resisting the stresses induced by high train speeds. Kenney's aim was to produce rails in which the elastic limit was sufficiently high to greatly minimize or entirely prevent the plastic flow of the outer metal of the rail head due to the concentrated wheel loads. The chart indicates the marked increase in elastic limit due to heat treatment. Not only does the greater elastic limit inhibit the tendency to plastic flow of the outer metal of the rail head, but the high elastic limit of the inner metal enables the steel to resist effectively the tendency to flow of the outer metal.

Moreover, the heat-treated rail has a far greater life than that of the untreated rail, due to its increased resistance to wear. According to recent reports from five railroads the average wear in the high rail, when heat treated, was only 54.6 per cent that of the untreated rail, and in the low rail, when heat treated, but 55 per cent of the untreated rail.

Messrs. Sandberg of England have developed a special method of heat treating rails involving the application of vaporized water ("Scotch Mist") to the rail head, followed by a controlled cooling. This process is now used by most of the rail-making plants in Europe, where up to March 31 of this year more than 100,000 tons of rails were produced through the use of this process. While this process has not had general application in this country, its possibilities must not be overlooked.

Correcting End Batter

One of the weakest elements of railway track under modern service conditions is the joint. Long before rails are worn out by the abrasive action of the wheels, the joints have usually become loosened by wear on the contact surface between the rails and joint bars, particularly under the heads of the rails and the tops of the bars. When the wear has become too great, rails are taken out of track, the ends cut off to remove badly worn parts, new holes drilled, and new joint bars installed on the shorter length rails. This relatively short life of the rail ends and joint bars is due in most part to the impact of the wheels in passing over the joints, especially where the impact has battered the rail ends to form a depression.

Efforts have been made to correct this battered condition by depositing molten steel to fill in these depressions, followed by grinding to an even surface. There is a danger in this practice because cracks in the rails thus treated are very likely to result. It is far cheaper and safer to prevent or minimize this battering than to attempt to correct it after it has occurred. The method most commonly used for accomplishing this is that of hardening the ends of the rails. Several methods of hardening rail ends are being used at the present time.

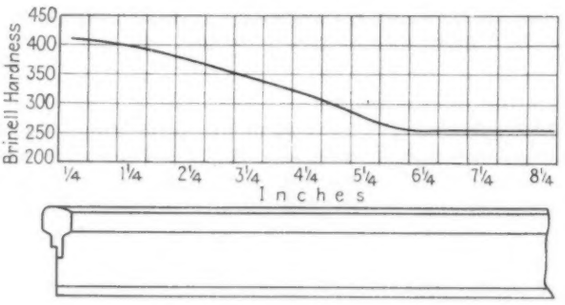
End Hardening of Cold Rails

In one method, the top surface of the head of the region at and adjoining the end of a cold rail is brought to a very high temperature by application of the electric arc or by torch and then subjected to a quenching action by means of water, oil, or air. The conduction of heat to the interior of the rail head, during the heating operation, is slow, and in many instances the depth of the metal heated to a quenching temperature may not be more than ⅛ in. When the quenching medium is applied the thin layer of heated metal is almost instantly quenched by the combined chilling action of the quenching medium and the cold portions of the rail. There is no gradation of hardness. Moreover, cracks frequently form at the junction of the hardened and unhardened metal. Rails which are laid in track before end hardening must, of necessity, be hardened while the body of the rail is cold. While considerable tonnages of rails have been end hardened in this way, there have been frequent breakages and spalling of considerable areas of the hardened metal.

Hardening Rail Ends from Mill Heat

The most satisfactory method for end hardening rails, not merely from the standpoint of safety, but also from technical and economical considerations, is to quench the end regions while the rails still retain the mill heat. At the mills of the Bethlehem Steel Co. the end regions are treated as the rails lie cooling on the hot-beds. A multiplicity of water jets is applied to the end regions from a portable quenching head, which also protects the remainder of the rail from accidental contact with the water. The period of application of the spray is automatically controlled by electrical timing apparatus. The large reservoir of heat in a full-length rail at a red heat and the plasticity of this red hot metal furnish ample assurance against any part of the rail being subjected to severe cooling strains.

Rails thus end quenched from the mill heat are either subjected to controlled-cooling throughout the length or, where the rails thus treated are not be controlled-cooled, a portable annealing cover is applied to each end when it has cooled to approximately 1000 deg. F., and this cover is retained in place until the rail end has cooled to below 400 deg. F. The degree of hardness and the depth of pene-



BRINELL hardness curve for a hardened mitre-cut rail end. Chart by Bethlehem.

tration within the head metal are easily controlled.

There are very substantial advantages in end hardening rail from the mill heat and control cooling the entire rail from 932 deg. F. to below 400 deg. F. This mode of treatment produces a rail having all the advantages set forth above for the controlled-cooled rail plus the added advantage of hardened ends.

Mitered End Rails

The high train speeds of the present and the future must be accompanied by riding comfort for passengers and reasonable costs in maintenance of rolling stock and track. The greater the speed the smoother must be the track. An important means to this end is the mitered-end rail.

About 30 to 40 years ago, rails were tried out in track having 45-deg. angle miter end faces, the mitered cuts extending the full depth of the rails. So far as giving better riding qualities and reducing batter at the joints they were a success. The movement of the rails, however, relative to one another, produced a wedging action which broke joint bolts and caused such a dangerous track condition that the rails were taken out of track and the idea abandoned.

Later the idea was proposed and carried out for providing a mitered cut to the head and a square cut through the base. This combination avoided the danger of wedging, but in preparing them it was necessary to machine the ends of the rails after they had become cold. This was so expensive that no considerable tonnage was ever installed.

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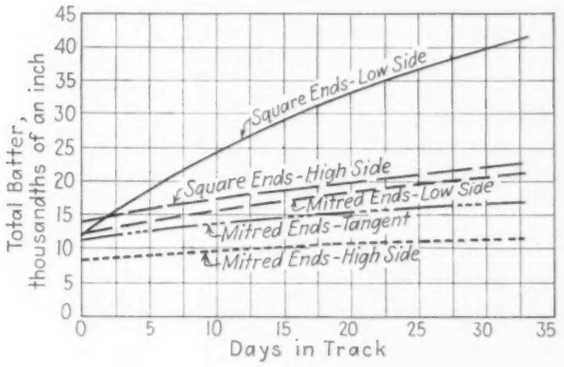
COMPARING the batter on mitred-end and plain-end rails for the first month of service on a sharp curve. Chart by Bethlehem.



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A few years ago a method was devised for producing this combination of square-end base and mitered head end quickly and accurately while the rail was still at the mill heat. All rails thus produced are absolutely interchangeable. Tonnages of mitered end rails thus produced, some hardened and some unhardened, have been in service up to three years on some of the most important railroads of the United States. They were purposely installed at points of extremely heavy traffic. The batter of the joints has been reduced from 50 to 75 per cent of the ordinary square-end rails, and the noise and shock, as the wheels of trains pass over the joints, decidedly reduced.

In this connection it may be well to point out that some of the railroads having the heaviest traffic have made long-time studies of joint batter. These studies show that of the total batter which occurs in a period of from 3 to 5 years, more than half occurs during the first few weeks. The passage of only a few trains is sufficient to batter the corners of the square rail ends and cause a marked blow as the wheel passes over. The mitered joints permit of the load passing gradually from one rail to the next, thus reducing the reversal of shear in the joint bar and protecting the end corners of both rails. Furthermore, a greater degree of hardening is permissible in the mitered end rails over that which could be safely given to the square end rails.

The accompanying chart shows a comparison of the batter on mitered end and plain end rails laid on a sharp curve in a heavy tonnage location. They were installed at that point to determine the behavior under heavy loads on a sharp curve. This chart shows that even under the most unfavorable conditions the mitered joint has definitely proved its utility.

The accompanying photograph illustrates an installation of mitered joints in the main line of one of the transcontinental railroads. Of particular interest in this picture is the showing of the insulated joint. This mitered joint is of special value under these cir-

(CONTINUED ON PAGE 88)

TREATED AND UNTREATED RAIL COMPARISONS
RAIL SECTION 130 R.E.

	Analysis (Per Cent)		Tensile Strength (Lb. per Sq. In.)		Elastic Limit (Lb. per Sq. In.)		Elongation (Per Cent)		Reduction (Per Cent)		Brinell (Average for Head)		Drop Test Permanent Set in Inches (First Blow)	
Heat	C	Mn	Treated	Untreated	Treated	Untreated	Treated	Untreated	Treated	Untreated	Treated	Untreated	Treated	Untreated
82K253	0.74	0.69	173,500	134,000	124,700	79,000	9.5	7.5	14.5	9.5	347	269	0.57	0.90
86K205	0.72	0.70	185,000	137,800	131,000	83,300	6.5	10.0	9.5	14.2	368	278	0.50	0.85
82K255	0.71	0.68	170,500	135,000	124,500	81,300	7.5	10.5	10.3	14.8	351	274	0.57	0.93
85K246	0.79	0.72	184,500	144,300	123,700	86,500	8.2	8.5	11.8	11.0	356	294	0.55	0.80
84K247	0.78	0.82	182,000	151,000	126,000	89,000	10.0	8.5	15.0	11.5	363	307	0.50	0.80
84K249	0.72	0.72	171,500	137,300	124,700	84,200	9.0	9.5	15.3	13.7	372	290	0.51	0.83
84K250	0.77	0.84	172,500	149,500	126,000	86,500	10.5	8.0	20.5	11.5	375	311	0.52	0.82
85K249	0.76	0.70	184,800	142,500	131,000	86,200	7.5	9.0	13.8	12.7	375	291	0.50	0.85
82K279	0.71	0.63	177,000	133,800	128,500	77,800	7.7	6.5	12.0	9.0	361	277	0.66	0.90
Average	0.74	0.72	177,900	140,600	126,700	83,300	8.5	8.7	13.6	12.0	363	298	0.54	0.86

Izod impact tests for standard 0.4-in. diameter notched bars: **Treated, 7 ft.-lb.; untreated, 2 ft.-lb.**

Steel Warehousing Industry Makes Progress

R. J. STAYMAN

UNIFORMLY high sales by warehouses throughout the summer months was the expectation of several hundred warehousemen and guests who registered at the 27th annual convention of the American Steel Warehouse Association, held at the Edgewater Beach Hotel, Chicago, June 10-12. This meeting was featured by lively interest, progressive reports by Lester Brion, president, Walter S. Doxsey, executive secretary, and by numerous special committees, and also by addresses by Walter S. Tower, executive secretary, American Iron and Steel Institute, and B. F. Fairless, president, Carnegie-Illinois Steel Corp.

Mr. Brion, in his opening remarks, welcomed members and guests to the annual gathering. His speech was entitled "Aims and Objectives." After outlining essential functions and purposes of the association, he informed his listeners that he wanted to take the occasion to overcome a common, harmful assumption that steel warehousemen are just so many jobbers in the ordinary meaning of the word.

Too often, he said, jobbers are thought of by the public at large as unnecessary middlemen, specializing in buying and selling odd, isolated or job lots of merchandise, and transacting this business so as to obtain an unfair advantage or profit. Mr. Brion made it clear that this was a fallacy; that, instead, a basic economy underlies the distribution of steel through warehouse channels, and that the steel industry could not properly function without the important outlet to a host of small consumers, large in the aggregate, provided through the media of strategically situated and fully stocked warehouses.

Inherent advantages of this service to the consumer were enumerated at length to prove the speaker's point. He explained that the word "jobber" conveys a bad impression about warehousemen, who, in fact, are distributers of steel and should be so recognized.

Distributers Handled 14.43 of Last Year's Steel

It was further pointed out that during 1935 jobbers, or distributers, bought 14.43 per cent of all the steel sold in that year. This placed them second in importance to the automobile industry as a leading customer of the steel trade. Moreover, the warehousing industry in 1935 came within a million dollars of exceeding the combined purchases of the railroads and the building industries. In the speaker's opinion, such figures should encourage the mills to extend their policy of setting up quantity extras on small quantities so as to divert small orders to the warehouses and eliminate the unfair competition to which distributers have been subjected by the mills on such orders.

Mr. Brion stated, however, that the mills are gradually coming around to an enlightened view of the subject. "They are seeing more clearly every day that it is actually cheaper to have the warehouse distribute these small quantities than to render this same service themselves. They have become increasingly aware of the cost of making direct shipments of small quantities, and are realizing that the sale of warehouse quantities at less than warehouse prices represents a red-ink transaction on their books."

In this regard, Mr. Brion mentioned the importance of the mills exercising judiciousness in selecting distributers of character, so that the invasion of the steel warehouse markets by agencies whose major function is not the distribution of steel would be discouraged. The American Steel Warehouse Association was cited as being actively interested in the furtherance of such aims.

Along different lines, its solicitude in advancing steel warehouse interests by collecting and disseminating useful statistics and information was referred to. The speaker intimated in so many words that it was high time members of the industry learned to pull together. The establishment and subsequent development of the S.A.E. in this country was mentioned to illustrate what is possible of accomplishment.

Another policy of the Association, according to Mr. Brion, has been its practical interest in promoting improved quality of iron and steel products. Also it has sought to promote the expansion of existing markets and the development of new ones. "This is a field where we can be of definite aid to the mills. We solicit from every

nook and corner, whereas, as a rule, the mills are in a position to devote their time only to the large consumer." For the warehousing industry to do a real job, the speaker declared that it must employ its own engineers. He said, too, that he felt a marked development in the employment of metallurgists and engineers by steel distributers would shortly take place.

The public at large should be educated to recognize distributers as "an essential cog in the wheel of the distribution of steel." They must be taught, likewise, "the unseen economies embodied in steel warehouse service."

The Association's Progress

A report of the Association's progress during the year was presented by Walter S. Doxsey, executive secretary. Mr. Doxsey, using charts and tables to illustrate, explained that considerable energy had been expended in efforts to obtain better merchandising opportunities on the complete range of warehouse products from hot-rolled bars to tool steels and stainless steels. Respective committees were successful in certain cases, but failed in others, according to the account. On hot-rolled bars, cold-finished steel, flat-rolled steel, hot-rolled alloys, boiler tubes, stainless steels and two tool steels, mill extras were revised to the advantage of the warehouse. On other items, price rationalization has still to be achieved.

The speaker commented that "the added sales and the added profits which are accruing to the warehouse industry as a result of the new extras which have gone into effect during the past year are difficult to estimate." He said he believed that these quantity extras on small mill items definitely established the warehouse as an essential factor in the distribution of steel, and assured the economic position of the distributer in the future.

Steel and the Warehouse

"Steel makers are now fully alive to the fact that not only must they know how to make good steel, but that they must also know how to sell it—how best to distribute it throughout an ever widening range of consuming markets." Walter S. Tower, executive secretary, American Iron and Steel Institute, addressing the convention on "Steel and the Warehouse," went on to remark that the warehouse has solved satisfactorily the problem of distribution to small users. He found that the natural position of the jobber or distributer in the distribution process is that of buying in full unit quantities and selling in split units, or fractional quantities.

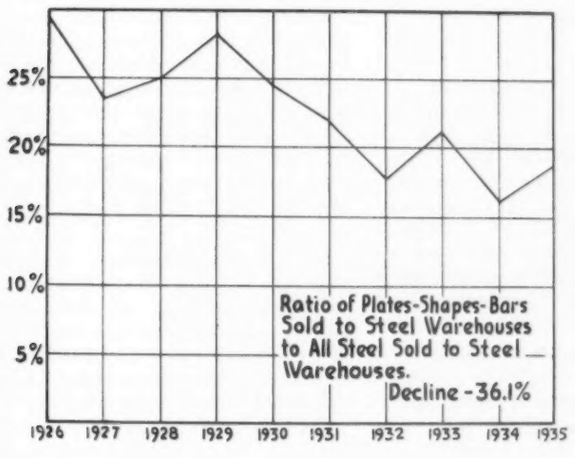
An estimate showing that warehousemen have over 200,000 customers on their books, or possibly several times the number served direct from the mills, was submitted. Thus, "the warehouse gives the steel industry its chief or only contact with that great army of buyers who take, in the aggregate, a substantial part of its output." The speaker also stated that approximately one out of every seven tons of finished steel products sold in 1935 went through jobbers' hands. It was pointed out that the figure included approximately 50 per cent of the galvanized sheets and about 40 per cent of the pipe and tubing. Mr. Tower likewise credited jobbers with distributing at least one-third of the wire and wire products and more than one-fifth of the concrete reinforcing bars.

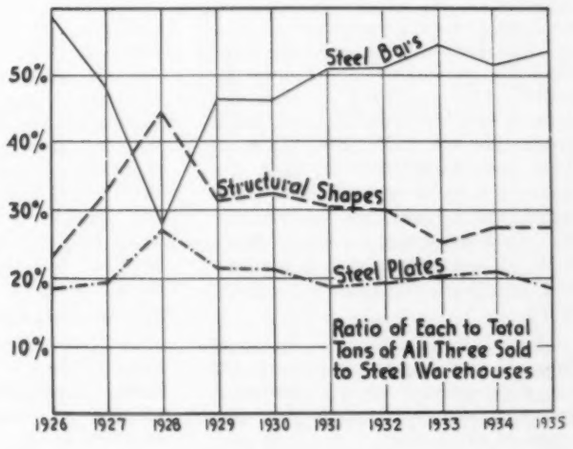
In sizing up the iron and steel industry, he said that many changes have taken place during recent years. Improved transportation, larger mill capacity, flexibility of production schedules and different habits of buyers have tended to discredit former warehouse practices of conducting a considerable business on the basis of speculative buying of steel for stock.

Favors Open Prices

This led to a discussion of relationships between distributer and producer. Mr. Tower said that while he thought there was an undeniable link between the two, and that indirectly the distributer represented the manufacturer, he was unwilling to concede that a distributer should be considered a part of the producer's organization. In so far as the distribution of steel was concerned, warehousemen were a distinct and separate group.

Mr. Tower complimented the producing industry on its recent action in getting prices out from behind closed doors into the open. "It provides a setting in which competition may become something that is sound and wholesome." With respect to distributers, he stated that they should derive their compensation for the service rendered out of the merchandising principle of mark-up of the goods sold. The policy of steel makers of public commitment to discounts for large quantity and extras for small quantity served in part, he said, to recognize the warehouse problems of investment in stock and the cost of handling it. It was predicted that what the steel makers have done to establish their business on an intelligent, open-minded basis,





the warehouse industry would do also.

With the ever growing volume and variety of new steels and alloys presenting an increasingly difficult problem of distribution to steel makers, the speaker remarked that no one just at present could say how the problem would ultimately be met. New applications and developments of steels, however, were described as calling for small quantities at the outset, and warehouses were stated to be a logical source of supply for that character of demand. "Whether or not the average distributer will be able or disposed to maintain adequate stocks of these special steels; or whether producers must be prepared to perform for themselves the required service of maintaining stocks is one of the interesting questions which only time can answer."

The growth of warehouses controlled or operated by steel producers was mentioned by Mr. Tower to illustrate a possible tendency. But he concluded that only a very few steel companies have a sufficiently complete range of products to justify the operation of mill-owned warehouses. "Without a range of products the warehouse is lacking one of its main reasons for existence." In closing he declared that the efficient distribution of steel called for mutual respect and confidence between the mill and the warehouse.

Distributers' Importance Increasing

Quantity differentials are the rightful protection for distributers, according to B. F. Fairless, president, Carnegie-Illinois Steel Corp., who was the speaker at the banquet. He predicted that in time this practice will be extended to all steel mill products handled by jobbers.

Mr. Fairless stressed the fact that warehouses are a vital part of the steel business and that their importance is increasing as steel producers give greater cognizance to distribution and selling. The time has passed when the steel industry strove to keep up with the growth of the country and when production and costs were the foremost considerations. In fact, the industry is in its second phase when sound and aggressive merchandising must be given an equal place with, if not actually a place one step ahead of, the older considerations.

The jobber is definitely a part of the steel merchandising picture. He can give service on an adequate and economical basis to a wide range of steel users not easily and economically reached by large producers. The one big thing he sells is service, and in doing so he services not only his customers but also the mills. All things considered, the distributer now has and will have for a long time to come a vital part in the world of steel.

The distributer is gaining strength because of the growth and still expanding numbers of types and analyses of steels, because mills cannot economically carry stocks to meet the exacting requirements of multitudinous small consumers, because specialties are increasing at a rapid rate and will continue to do so for many years to come, and because further mechanization of mills precludes proper scheduling for expected economies. Here again the jobbers fit into the picture.

Mr. Fairless urged distributers to continue close cooperation among themselves and as a group to foster wholesome cooperation with the mills.

Directing Mills From Warehouse Field

Ways of directing mills away from the warehouse field were outlined by Charles M. White, Republic Steel Corp. He urged warehousemen to give consideration to the size and character of their orders, and to hold to standard nomenclature as a matter of avoiding confusion. The steel industry should by no means short cut the jobber and by the same token the distributer should take the attitude of cooperation. He stressed costs of production to show that small orders often mean losses to the mills and therefore stand in the way of rational economic solution of the problems faced jointly by producers and warehousemen.

Committee Reports

Adequate relief from the problem of foreign steel imports cannot be expected so long as the present Administration remains in Washington, according to another speaker. It is opposed to high tariff, application of the anti-dumping act is clumsy and inadequate and the 50 per cent tariff advance allowable by the flexible tariff act will not give needed relief. This is the situation which prevails in the face of increasing importations and improved quality of foreign steel. Solution is blocked by a basic political question which cannot be solved without a sympathetic administration in Washington.

In some areas galvanized sheets have fallen to the state of a loss leader largely because of the great number of non-association sellers who specialize in this commodity. As a solution, it was suggested that mills scrutinize their outlets more closely and that quantity extras be applied as on other flat rolled products.

The question of seconds came in for long discussion, mills claiming that seconds as such are not produced but that insistence on higher quality and closer inspection are increasing the seconds tonnage above the old expectation of about 5 per cent.

Discussion of stainless steels was led by E. D. Graff, Joseph T. Ryerson & Son, Inc., Chicago. His point of view is that Mid-Western jobbers in adopting mill parity have not given up all margin of profit. He said further that the size of orders is satisfactory. He urged that mill parity be adopted throughout the country and that jobbers should go to the mills for relief, if needed.

Officers Elected

Ralph J. Stayman, Jones and Laughlin Steel Corp., Pittsburgh, was elected president of the Association. The six vice-presidents are L. H. Jostes, Beck and Corbitt Co., St. Louis; A. C. Castle, A. M. Castle & Co., Chicago; C. C. Dodge, Geo. F. Blake, Inc., Worcester; Charles Heggie, Scully Steel Products Co., Chicago; E. D. Graff, Joseph T. Ryerson and Son, Inc., Chicago; and E. L. Parker, Edgar T. Ward's Sons Co., Pittsburgh. J. Frederick Rogers, Beals, McCarthy & Son, was elected treasurer.

Widening Fields for Permanent Mold Castings

PERMANENT mold casting of white metal alloys for parts used outside of the automotive industry is reported as now approximating parts totals called for by automobile manufacturers. The Bohn Aluminum & Brass Corpn., Detroit, notes this heavy expansion as a development of the past two years, and as involving vending and shoe repair equipments, radiators, typewriters, aircraft parts and many household utensils.

The association of Iron and Steel Manufacturers has just issued Specification No. 202-36 for seamless intermediate alloy steel still tubes for refinery service.

Copies may be obtained on application to the association at 616 Investment Building, Pittsburgh.

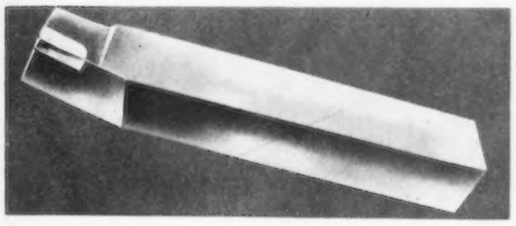
New Tantalum Carbide Tool Materials Feature Increased Strength

By PHILIP M. McKENNA

Research Director and Vice-President, Vanadium-Alloys Steel Co., Vascoloy-Ramet Division, North Chicago, Ill.

TANTALUM carbide tool compositions featuring a striking increase in the strength and cutting qualities of steel-cutting tools of this nature have been made available within the past few months.

Tantalum carbide tools have been increasingly used. In 1935 more than 25,000 high-percentage tantalum carbide tools had been successfully applied to steel-cutting, as turning and lathe tools, boring tools, but this use is only a forerunner of the applications now commercially economical due to the increase in strength of this material brought about by recent discoveries.



TOOL tipped with high strength tantalum carbide for turning steel.

The advantageous property of tantalum carbide compositions in resisting tool wear of the type produced in steel cutting had been observed over seven years ago. This resistance to "cratering" is due to the decreased friction of tantalum carbide compositions on the steel surfaces of the chip. It is also observed in tantalum-carbide wire drawing dies, which do not "pick up" and gall the steel wire being drawn.

The early tantalum carbide compositions had a break strength on transverse rupture tests of about 80,000 lb. per sq. in. Later this was increased to 275,000 lb. per sq. in. with the same hardness or slightly greater, namely, about 88.3 Rockwell "A." High-speed steel has a strength of about 400,000 to 500,000 lb. per sq. in. under the same conditions of test, when in the hardened condition, and the better cutting qualities of high cobalt-tungsten-vanadium high-speed steels are obtained at some sacrifice in strength, in some instances being about 350,000 lb. per sq. in. Results of research have now produced tantalum carbide compositions for steel-cutting having strengths comparable with high-speed steels, namely, as high as 403,000 lb. per sq. in., at a hardness of 87 Rockwell "A," and possessing the unique wear-resisting properties of tantalum carbide.

A series of tool compositions of tantalum carbide is being placed on the market ranging from 91.8 Rockwell "A" to 87.0 Rockwell "A" with strengths from 185,000 to 403,000 lb. per sq. in. in cross-rupture tests, to be used particularly for the general machining of steels.

These tools have been put on work of a nature generally destructive to hard carbide tools in the past, with very advantageous production of machine steel castings having sand holes and hard spots, at half the machining time of high-speed steel tools. For example, flanges on large steel castings 42 in. in diameter machined on Bullard vertical machines were faced with ¼ to ⅜-in. depth of cut, with intermittent cuts due to eccentricity of the casting and through sand holes, at 144 ft. per min. cutting speed with 0.011-in. and 0.018-in. feed per revolution. With the latter feed the machine stalled due to the belt slipping, without, however, damaging the tool, when the 0.011-in. feed was adopted.

Another instance was in the machining of oxy-acetylene welded flash on 8-in. diameter steel parts, the cut being irregular, intermittent, and in some spots, hardened by picking up carbon from the acetylene. This was done at 150 ft. per min. with the same feed customary with steel tools.

In general, the increased strength of the new tantalum-carbide steel-cutting tools permits greater rakes and clearances than customary with other hard carbide tools, with resulting greater cutting efficiency. The angles are intermediate between those used for steel tools and those used for the usual cemented carbide tool.

Results obtainable with the new tantalum-carbide tools will extend their economical use to a much wider range of jobs where rougher use is required. Also, materials such as cast alloy steels of high chromium or high manganese type, hitherto machinable with difficulty, may now be easily fabricated by machining and at much lower cost.

Western Pennsylvania Industrial Conference

THE sixth annual Western Pennsylvania Industrial Conference was held on June 13 and 14 at Hotel Conneaut, Conneaut Lake Park, Pa. Dr. J. Steel Gow, director Falk Foundation, Pittsburgh, gave a talk on "Keeping Prices Down," and a demonstration was given by Dr. Phillips Thomas, research engineer, Westinghouse Electric & Mfg. Co., on "Ramblings in Research."

At the group conferences, discussions were held on "Building the Working Force," "Personnel Policies," "Wage and Salary Administration," "Foremanship Relations," and "Industrial Controls." At the closing session an address on "Better Men and Bigger Responsibilities" was given by A. A. Nicholson, manager personnel department, Texas Co., New York.

Establishing a new policy in the porcelain enameling industry, the Ferro Enamel Corp., Cleveland, will grant one-week vacations with full pay this summer to all shop employees. Ferro's total tonnage shipments for the first five months of 1936 show a 20 per cent increase over the same period last year and a 50 per cent increase over the same period in 1934.

Mr. and Mrs. Verity reviewing the parade.

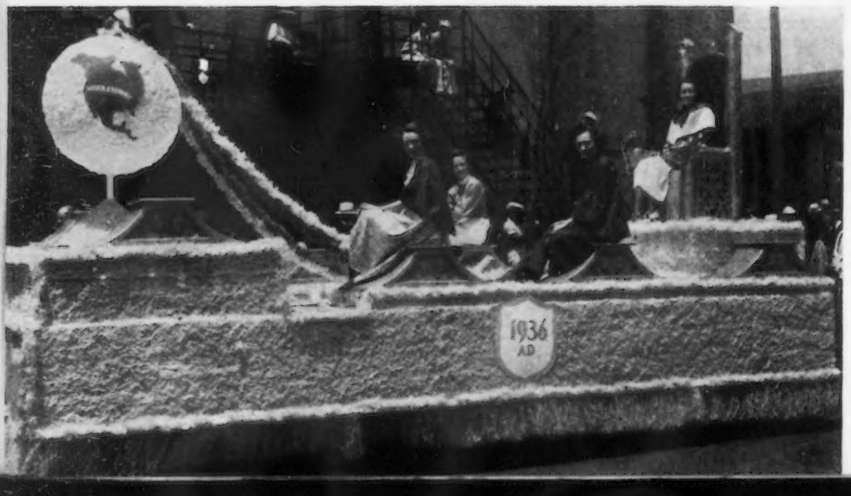
Twenty-five thousand people participated

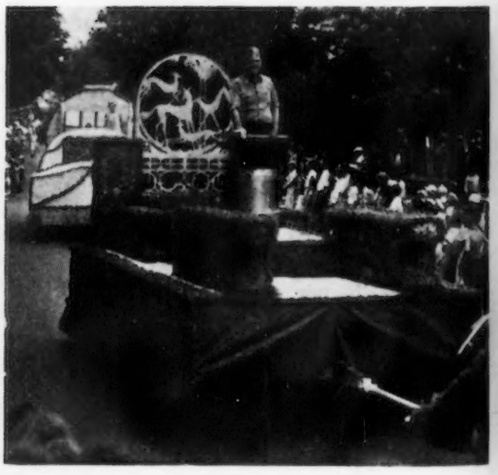
▲ ▲ ▲

Middletown Celebrates "Verity Day"

All community organizations participated

▼ ▼ ▼



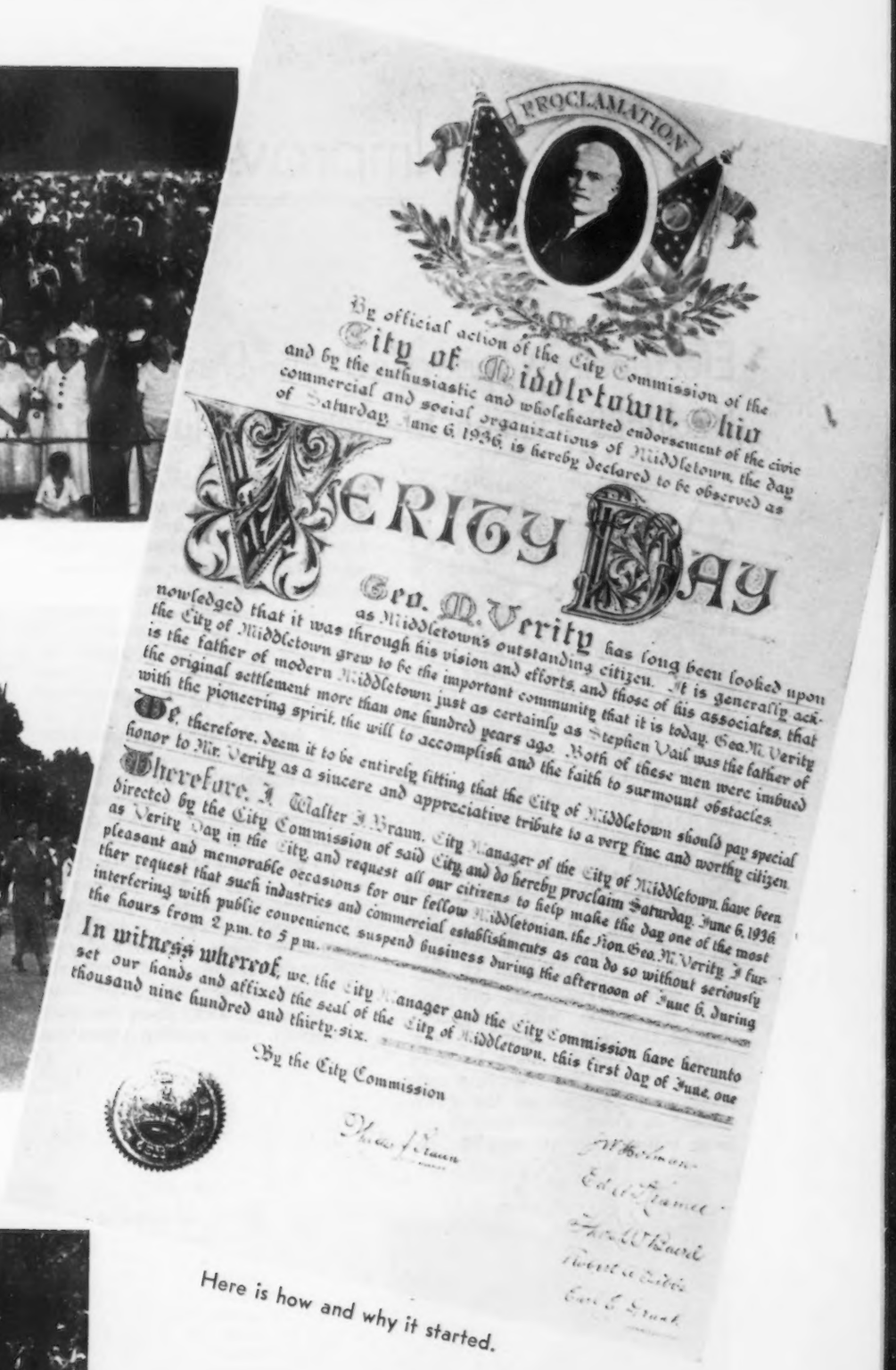


Artistically decorated floats depicted civic activities and

in the celebration.

in the parade of honor.

in which the "first citizen" has given leadership support



PROCLAMATION

By official action of the City Commission of the
City of Middletown, Ohio
and by the enthusiastic and wholehearted endorsement of the civic commercial and social organizations of Middletown, the day of Saturday, June 6, 1936 is hereby declared to be observed as

VERITY DAY

Geo. M. Verity has long been looked upon as Middletown's outstanding citizen. It is generally acknowledged that it was through his vision and efforts, and those of his associates, that the City of Middletown grew to be the important community that it is today. Geo. M. Verity is the father of modern Middletown just as certainly as Stephen Vail was the father of the original settlement more than one hundred years ago. Both of these men were imbued with the pioneering spirit, the will to accomplish and the faith to surmount obstacles.

We, therefore, deem it to be entirely fitting that the City of Middletown should pay special honor to Mr. Verity as a sincere and appreciative tribute to a very fine and worthy citizen.

Therefore, I, Walter J. Braun, City Manager of the City of Middletown, have been directed by the City Commission of said City and do hereby proclaim Saturday, June 6, 1936 as Verity Day in the City, and request all our citizens to help make the day one of the most pleasant and memorable occasions for our fellow Middletonian, the Hon. Geo. M. Verity. I further request that such industries and commercial establishments as can do so without seriously interfering with public convenience, suspend business during the afternoon of June 6, during the hours from 2 p.m. to 5 p.m.

In witness wherrof, we, the City Manager and the City Commission have hereunto set our hands and affixed the seal of the City of Middletown, this first day of June, one thousand nine hundred and thirty-six.

By the City Commission

Here is how and why it started.

For news account of the tribute paid by the citizens of Middletown, Ohio, to George M. Verity, chairman, American Rolling Mill Co., see THE IRON AGE, *June 11, page 71.*

Improvements in Production ar

Electrically Controlled Air Device Reduces Human Element in Clutching

AN electrically controlled air operator for friction clutches and brakes is announced by the Cleveland Punch & Shear Works Co., Cleveland. Design is said to eliminate lost time due to normal delays in manual clutch throwing, for power press operation. Each man working on a press is provided with one or more push buttons, either hand or foot operated; when all buttons are depressed, indicating complete work readiness, the new device supplies clutch throwing movement. Any individual button pressure will stop the press at any position of its stroke.

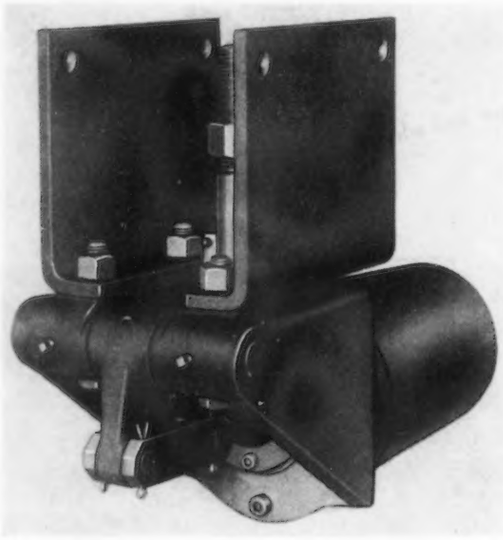
Electrical equipment may include a four-position selector, momentary, long, inching and continuous operation. With the selector set in momentary position, pressure and immediate release of all buttons will provide one complete press revolution with automatic stop at top center. For the long stroke, all buttons must be held down until the slide reaches a predetermined position on the down stroke, at which point buttons release will provide a complete revolution and similar automatic stop. The inching and continuous operation positions are merely button pressure. Installation is close up to thrown member, and response is said to be immediate.

Universal Abrasive Cut-Off Machine

AN abrasive cut-off machine which provides for a chop-stroke, a drawstroke, or any combination of the two, is announced by the Bethlehem Foundry & Machine Co., Bethlehem, Pa. General utility design permits that the head may be swung to any angle with relation to the table. A graduated scale simplifies angle positioning. In extreme cases, such as heavy or odd shaped castings which can not be carried on the table, the head may be swung away from the table to perform the cutting operation on a work-piece held by improvised means. Adaptability for dry cutting is said to range in materials from cold rolled steel and nonferrous metals to cinder blocks and brick. Submerged cutting of high-speed and alloy steels, synthetic plastics and rubber is recommended as is coolant system cutting of stone, concrete, porcelain and tile.

Limited Quantity Blast Cleaning Equipment

THE American Foundry Equipment Co., Mishawaka, Ind., is marketing a small Wheelabrator unit having an operating load capacity of five cubic feet for limited production in automatic cleaning. Work is loaded onto an apron conveyor which cascades the individual pieces, over and over, directly under the blasting area. Centrifugal force is the driving agent for whipping gravity-fed abrasive onto the work. Refuse is automatically screened out. The company's Dustube dust collector is used. The abrasive cycle is constant during operation.

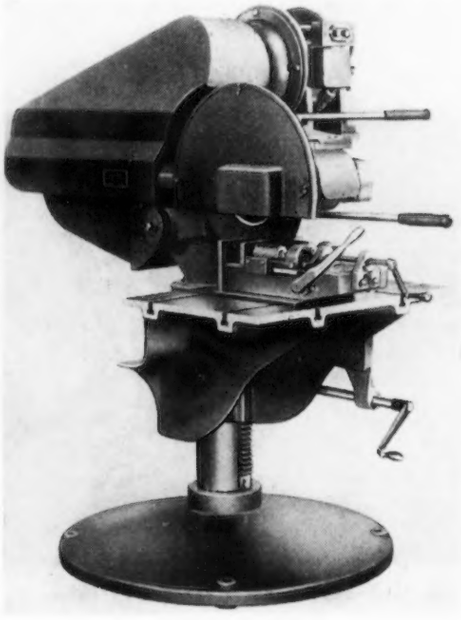


AT LEFT

THIS air-operator for heavy friction clutches and brakes can be attached to installations which are now utilizing man power for clutching and de-clutching operations.

AT RIGHT

STRAIGHT and draw strokes or any combination of the two are provided for in the operating design of this abrasive cut-off machine. All angle positioning is assisted by graduated scale.

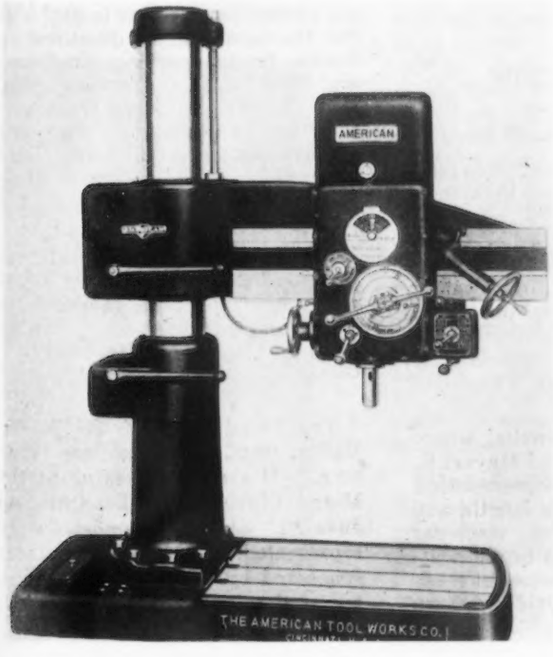


and Shop Equipment . . .

High Speed Radial Drill Provides Fast Tapping Through Reversing-Motor

THE American Tool Works Co., Cincinnati, has announced its Hole Wizard radial drill in three and four-foot arms and nine-inch diameter column. Economical drilling and tapping capacities are specified as 1¼ in. in cast iron and ¾ in. in steel, and 2 in. in cast iron and 1½ in. in steel; respectively in nine- and 12-spindle speed models. Speeds in geometrical progression are provided covering a standard range of 70 to 1500 r.p.m., nine speed machines, and 50 to 1500 r.p.m. for the 12 speed machine. Through the use of pick-off gears ranges may be changed to suit the requirements of other ranges up to 100 to 3000 r.p.m. A single direct reading lever provides simplicity in control of speeds. Tapping attachments are eliminated; this operation being accomplished by means of a reversing motor said to require but approximately 2½ seconds for reversal from high forward to full reverse. Through the driving motor, a small control lever operates a double pilot control switch in conjunction with a magnetic reversing switch, reliability is said to be a feature of the unit. Head assembly is specified as 100 per cent anti-friction and has automatic pump lubrication. Head movement is accomplished manually with a large handwheel, one revolution of which produces three inches of head travel. Shafts are of hardened alloy steel with ground splines and lands. Gears are finish lapped under a light predetermined load. The nitralloy steel spindle is nitrated for surface hardness and the sleeve, of like material, is honed to size. Sleeve mounting is in precision Timken roller bearings and is provided with means for convenient adjustment. Hardened and ground helical gears are employed in the spindle drive which is effective at the bottom of the head, at closest proximity to work.

Four rates of geared power feed include 0.004, 0.007, 0.012 and 0.020 in. per revolution of spindle on the nine-speed machine; six rates 0.004, 0.007, 0.011, 0.014, 0.017 and 0.025 on the 12-speed machine. Connection between the feeding unit and the spindle is through band type friction, adjustable from the outside. Spindle hand feed is provided with a patented safety feature. Automatic feed trips are set from zero on a graduated dial. Power elevating and lowering movements are by a small 1½ hp. shell type motor and reversing drum forming a built-in unit at the rear of the arm girdle. A directional control lever clamps and unclamps the arm is unison with the elevating mechanism. An impingement type of clamping mechanism for the column is controlled by a front lever operating in a vertical plane. Plain box, universal, swinging box or worm-swiveling tables provide a wide selection for operating convenience.



o o o

TWO models are built in this new line of rapid-work radial drills. One model involves nine standard speeds, the other twelve. Each has a nine-inch column diameter. A variety of tables provides for wide utility.

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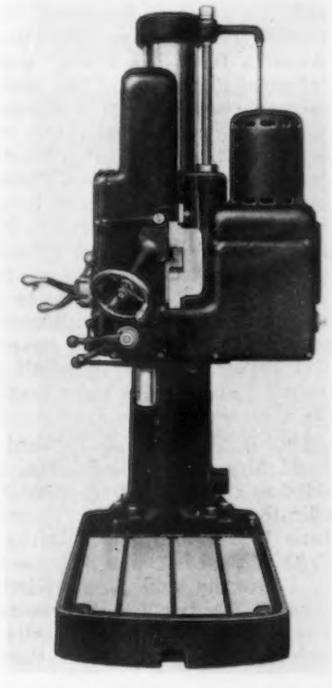


Mechanical Engineers Hold Applied Science Meeting At Pittsburgh

THE American Society of Mechanical Engineers held its fourth national applied mechanics meeting, June 11 to 13, at Carnegie Institute of Technology, Pittsburgh. Professor H. M. Westergaard, University of Illinois, presided during the session on thin-walled structures. Dr. J. N. Goodier, Toronto, discussed "Thermal Stresses in Thin Cylinders Due to Temperature Variation Round the Circumference and Through the Wall," while Dr. J. L. Maulbetsch of the University of Michigan, discussed "Buckling of Compressed Rectangular Plates with Built-in Edges," and R. G. Sturm and R. L. Moore, research laboratories, Aluminum Co. of America, presented the "Behavior of Rectangular Flat Plates Under Concentrated Loads."

At this session the following papers were also presented: "Cantilever Plate with Concentrated Edge Load." by Dr. D. L. Holl of the University of Iowa; "Torsionless Bending of a Hollow Beam by a Transverse Load," by Professor W. L. Schwalbe, University of Illinois, and "Stability of Rectangular Plates Under Shear and Bending Forces," by Dr. S. Way, research laboratories, Westinghouse Electric & Mfg. Co., East Pittsburgh. An inspection trip to the research laboratories of the Aluminum Co. of America, was also made on June 11.

Elmer Allen Holbrook, dean, University of Pittsburgh, presided as chairman during the session on plastic flow and creep, held on June 12. Professor S. C. Hollister, Cornell University, discussed "Plastically Pre-stressing the Region About a Hole in a Plate," and an informal discussion of the problem of creep was held. The discussion was led by C. R. Soderberg, manager turbine division, Westinghouse Electric & Mfg. Co., Philadelphia, and by Joseph Marin, Rutgers University, New Brunswick, N. J. Professor Hollister also presented a paper entitled "Stresses in a Hemispherical Shell Due to Restraint at the Edge." Inspection trips to Westinghouse Research Laboratory and to the Gulf Research Laboratories were made in the afternoon.

Dr. R. Eksergian, Edward G. Budd Mfg. Co., Philadelphia, presided as chairman at the session on vibration, held in the morning, June 13. "Vibration Reduction at Critical Speeds," was discussed by C. Concordia and A. L. Kimball, General Electric Co., Schenectady. The subject of "Forced Vibration in Non-linear Systems with Various Combinations of Linear Springs" was presented by Dr. J. P. Den Hartog and R. M. Heiles of Harvard University, and "Criteria for Stability of Vibrating Systems" was discussed by S. J. Mikina and J. G. Baker, research laboratories, Westinghouse Electric & Mfg. Co. A paper on "Theoretical and Experimental Investigation of the Vibration of Turbine Foundations" was presented by S. Vesselowsky, Detroit.

At the afternoon session on general mechanics, Prof. N. C. Riggs, Carnegie Institute of Technology, presided. John H. Marchant, Columbia University, New York, discussed "An Electrical Resistance Method of Determining the Mean Surface Temperatures of Tubes." William Howard Clapp, professor, California Institute of Technology, Pasadena, Calif., presented a paper on "An Efficiency Equation for Gears." "An Analysis of Journal Bearings of Finite Length" was presented by E. O. Waters, professor, Yale University, and Professor Max M. Frocht, Ph.D., Carnegie Institute of Technology, Pittsburgh, discussed "An Approximate Method for the Determination of Principal Stresses." Professor Hollister talked on "The Scientific Studies of Coulomb" at the annual dinner, held on the evening of June 13.

Seven Metallurgical Divisions Set Up

THE metallurgical department, Carnegie-Illinois Steel Corp., Pittsburgh district, will establish seven divisions, with the following appointments: G. N. Schramm, manager of the strip and sheet division; A. B. Grange, manager of the tin plate division; F. T. Bumbaugh, manager of the bar and semi-finished division; G. E. Knable, manager of the structural and plate division; R. W. Steigerwalt, manager of the railroad materials and commercial forgings division; W. A. Jayme, manager of the alloy division; L. Jeffries, manager of the claim division, and R. W. Simon is appointed metallurgical assistant. Leon C. Bibber will be welding engineer for the company.

Bethlehem Building Light-Weight Cars

ACCORDING to an announcement just made by Bethlehem Steel Co., Bethlehem, Pa., work has been started at its Harlan Plant, Wilmington, Del., on 60 two-car articulated units of light-weight construction that were purchased by the Railway Equipment & Realty Co., Ltd. (Key System), for operation over the San Francisco-Oakland Bay bridge.

These light-weight units, whose bodies are to be made of Mayari R, a high-tensile, corrosion-resisting steel, will be 110 ft. in length, and will seat 124 passengers. Each car will be equipped with a forced heating and ventilating system of a capacity sufficient to provide 4000 cu. ft. of air per min.

They are designed to operate singly or up to seven units (14 cars) in a train over the bridge from San Francisco and through Oakland and its outlying districts.

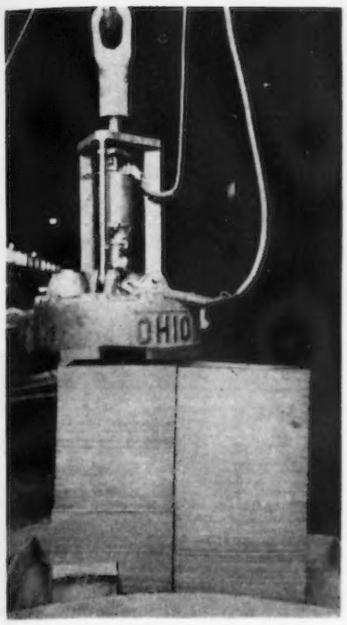
Large Percentage Of Republic Workers Vote

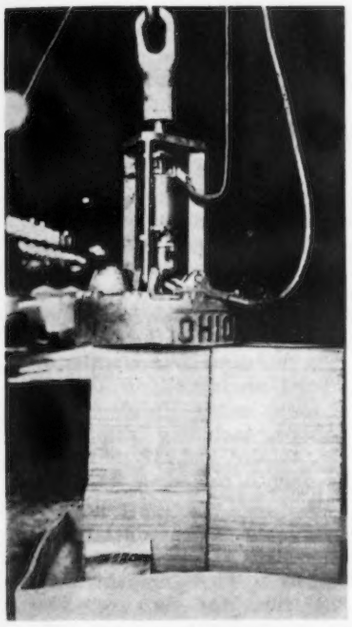
AT the annual election of employee representatives held June 12 in the 37 plants of the Republic Steel Corp., 27,701 employees voted, or 95 per cent of the employees eligible to vote. A total of 280 employee representatives were elected by the employees to represent them in collective bargaining.

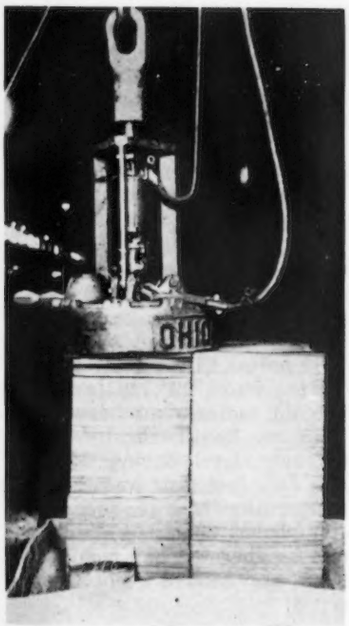
The elections are conducted by secret ballot under supervision of employees and the representatives are elected for one year to deal with the management on questions of wages, hours, working conditions and other matters of mutual interest. The workers in each plant have their own representation plan with opportunity to deal with their own local problems according to their own local needs.

Employee representatives in Republic plants in 1935 handled 1643 questions with a settlement of 78 per cent of the total favorable to employees.

The foundrymen of the Miami Valley, Ohio, and immediate territory, held a dinner meeting at the Miami Club, Miamiville, Ohio, on June 10. About 36 foundries were represented. The meeting was sponsored by the Cincinnati chapter of the Gray Iron Foundry Society.







Process for Separation of Black Sheets After Annealing

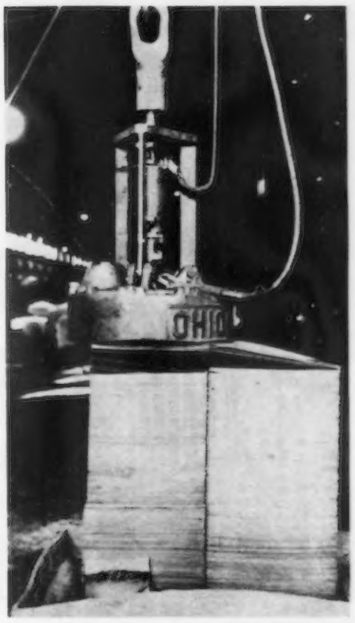
FOR the magnetic separation of black sheets from piles after annealing a magnetic sheet separator in which there is the combined use of a sledging process and a lifting magnet has been brought out by the Ohio Electric Mfg. Co., Cleveland.

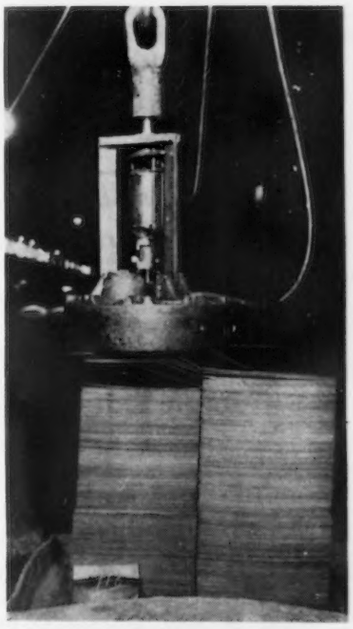
Manual separation of black plate in tin mills for making coke tin plate is slow and requires very strenuous labor with sledge hammers, crowbars and other tools as well as considerable muscular effort in tearing the sheets apart by hand. The speed at which the sheets are separated manually depends on the temperature at which they have been annealed. A high annealing heat, which is regarded as desirable, causes an increase in the number of "stickers" and slows manual operation.

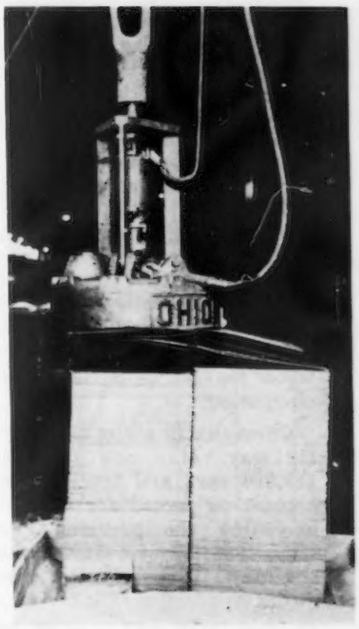
The recently developed sheet separator consists of a 29½-in. Ohio lifting magnet and a 25-cycle, a.c. Syntron hammer which has a rounded plunger which protrudes through the center of the magnet. The magnet and hammer are carried on a tripod. Cables that supply current for the magnet and hammer extend from the cab of the crane that handles the separating unit. The magnet has a curved V-shaped working face, the center being about 1 in. out of line with the outer edges. It is equipped with an automatic quick drop control and arc suppressor, the special master control having three operating buttons for "hoist, drop and hammer," which is said to be essential in controlling the separator because they permit quick lift and drop without danger of injuring the controller contacts.

In operating the separator the crane man lowers the magnetic unit down on the surface of a pile of sheets until the hammer head rests on the sheet. Then he operates the hammer for perhaps a half minute. After the sheets are partially loosened by the blows of the hammer the operator lifts the magnet about ½ in., turns the current on and off, the special control making possible quick lift and quick drop. Then the separator is raised to about 1½ in. above the pile and the current is again turned on and off rapidly, resulting in a further loosening of the sheets. The energizing of the magnet is usually repeated at about 2½, 3 and 3½ in. above the pile. After these operations it is stated that more than 95 per cent of the sheets are completely separated and a further repetition of the process results in effecting practically 100 per cent separation. The hammer operation may be repeated at any time if required.

When sheets are separated manually it is stated that one man will separate an average of 100 in. of sheets in an 8-hr. day. With the use of the mechanized system of separation considerable saving in labor is claimed to be effected as well as elimination of a great deal of hard manual labor. Applications have been made for patents to cover process.







THIS WEEK ON THE ASSEMBLY LINE

. . . Schedules holding up exceedingly well as sales continue to hold high lead over year ago.

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. . . Steel sellers find first half of month equal to May volume of orders as buyers cover on current prices.

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. . . Small cars and small engines planned and talked of to find market where economy of operation counts.

DETROIT, June 16. — After passing through what amounted to a record-breaking month for more than one company in May, automotive production schedules are being maintained surprisingly well through the middle of June. The previous week's decline of over 7000 units has been brought almost to a halt as the loss for the week ended June 13 was only 1300 units. Cram's estimate for the period is 100,415 cars and trucks, as compared with 101,752 for the week ended June 6. Individual adjustments to sales activity caused a number of ups and downs in output trends for the week, and there is talk right now of further upward adjustments in anticipation of a spurt in sales when the bonus money gets into circulation.

Chevrolet is going to town in a big way. May new car sales of 129,816 cars and trucks were the highest on record for that month, exceeding the previous high of May, 1928, by over 7000 units and the May, 1929, figure by over 18,000 units. The company's sales in April established a new all-time high for any month of any year and the totals for March and May approached that high point so closely as to concentrate within the past 90 days all three of Chevrolet's biggest months. Total sales for the period were approximately 390,000 units and for the year to date 535,634 units.

On the basis of present prospects, Chevrolet officials estimate that they should have 610,000 retail sales to their credit at the end of the five months' peak selling season, from March 1 to August 1, as compared with 540,000 units sold in the corresponding period in 1929.

Chevrolet's problem will be to adjust its present production volume so as to build a sufficient number of cars ahead to carry over the inevitable shut-down period this summer. Of all the car manufacturers, Chevrolet faces the largest change-over program. It is estimated that close to $25,000,000 will have been spent for machinery and tooling on the new job, which will have a new engine, transmission and rear axle.

Motor Car Sales Still Make Records

May sales of General Motors cars as a whole to consumers in the United States totaled 194,628 units, a gain of 78.5 per cent over May, 1935. Retail sales for the first five months totaled 774,695, a 51 per cent increase over the 511,053 units for the same five months of 1935. Total production of General Motors units in the United States and Canada, including shipments overseas, totaled 952,237 units for the five month period, a 34.5 per cent gain.

Factory sales or production of the Automobile Manufacturers Association as a whole amounted to 1,592,381 units for the first five months, representing a 26 per cent gain over the same period in 1935, indicating that General Motors so far this year is getting a larger proportionate share of the market than last year. May production figures for members of the association are estimated at 371,294 cars and trucks, 6 per cent under the previous month and an increase of 49 per cent over May of last year.

Based on registration figures from 20 States, R. L. Polk & Co. estimate new passenger car sales in the United States during May of 370,000 units. In May last year total sales were 293,199 units, which would indicate an increase of 26 per cent. Retail sales held at a fairly even level during May, June and July last year and there is no reason why these proportionate gains should not be sustained this year for the next two months.

Because automotive schedules

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By FRANK J. OLIVER
Detroit Editor, The Iron Age

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have been sustained at such high levels, the volume of steel specifications issued during the first 10 days of the month held up exceedingly well. Many local sales managers report orders equalling in volume those received during the first 10 days of May. Obviously, because of contemplated price changes, most of these specifications are for delivery before July 1 and a fair percentage of the business represents speculative buying, principally on the part of Chrysler Corp., which has committed itself on specifications for first run on 1937 model parts.

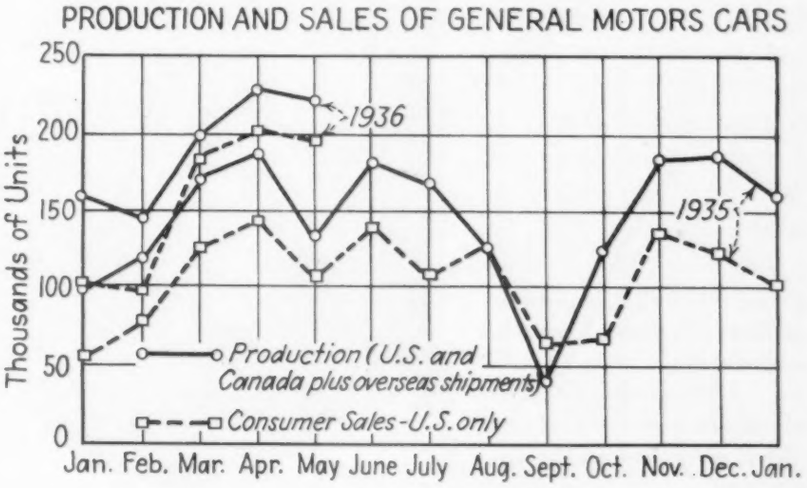
Tool and die shops in the vicinity are fairly well occupied at the present time, although tool business has not yet reached its peak. Local job shops are laboring under the severe handicap of a shortage of skilled men, but there has been little or no attempt by shops to steal men from one another. Although the Automotive Tool and Die Manufacturers Association has about 11,000 men registered in its employment bureau, all these qualified men are placed, and it has not been possible to fill any requests from member shops for men during the past few weeks.

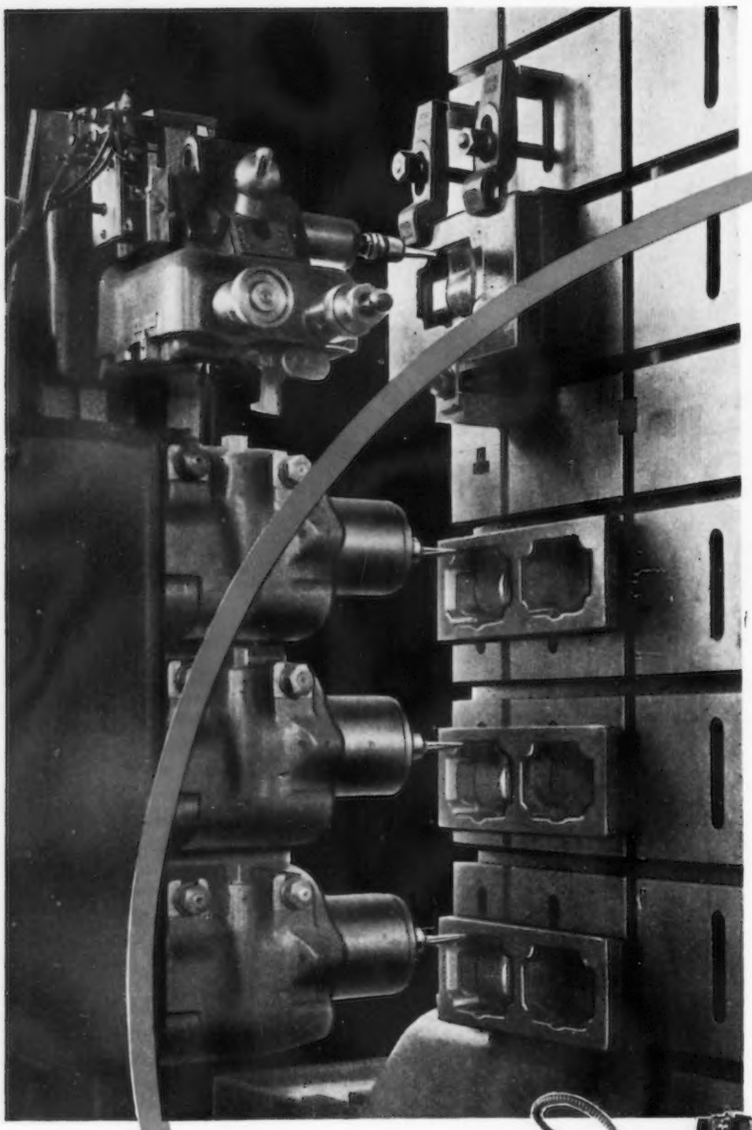
The situation in the tool and die shops is a little puzzling at present, since a great deal of the business that was expected earlier in the year has not yet been placed. Practically no Chrysler die work has been let to date. One reason that might be attributed to this general condition is that current models are selling at such high levels that the manufacturers do not believe it necessary to make any radical changes next year, certainly as far as bodies are concerned. Mechanical changes there will be in plenitude, but it appears now that body changes will be largely styling changes in front ends and perhaps a little more slope to the rear panel.

Revival of Small Cars

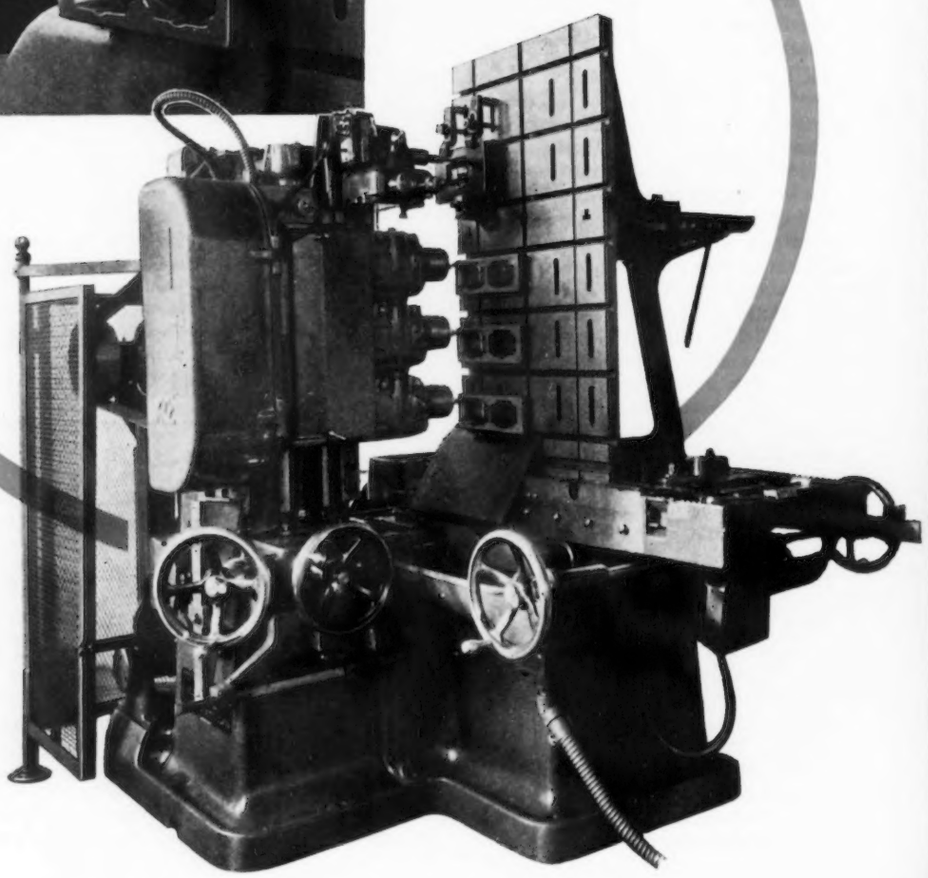
The revival of the American Austin Car Co. in the form of a reorganized American Bantam Car Co. at Butler, Pa. indicates that there is still some hope of reviving a market in the really low-priced class. The new car is said to sell for around $300 and the chief play will be on economy of operation—40 to 50 miles to a gallon of gasoline. Here in Detroit there have been all kinds of rumors going around in the past month to the effect that one of the larger manufacturers is getting into production on a car that, even though it might be standard in size, would at least feature a midget engine that would combine good performance with high fuel economy. Already this company is said to be producing 1200 of these motors a day. Where these motors are going no one knows. Some say they are consigned to South America, but this is conceded to be a blind. At any rate, the question of fuel economy is bound to be further emphasized in 1937 models.

To combat the type of advertising that converts mileage between two points into gallons in a well-known six, the Ford Motor Co. is now equipping its dealers with demonstrator cars on which actual mileage tests may be made. A graduated gallon-jug is to be strapped to the inside of the dashboard of these cars and the customer can be shown in a dramatic way just how far the car will go on a gallon of gas. Twenty miles is the figure claimed, if the vehicle is not driven over 40 miles an hr. Mileage claims are rather hard to pin down. At speeds in excess of 50 miles an hr., power going into bucking wind resistance becomes an exceedingly large part of the total power developed and head winds that may be encountered add an additional variable.





This is a core box which must be duplicated many times over in the foundry work for a well known small automobile. A wood master is used. In the illustration the three left cavities are being cut simultaneously. Later the master will be shifted to the right, and the three right cavities cut in the same manner.



This is the Keller Automatic Tool Room Machine, Type BL, equipped with the Three Spindle Head. The core box job it is producing in triplicate is shown in detail above and on the opposite page.

This is an absolutely unretouched photograph showing the core box just as it left the machine without any hand finishing.

The KELLER

Three Spindle Automatic Tool Room Machine triples production!

THE savings which may be effected by the use of the Keller Automatic Tool Room Machine, Type BL, on die, mold, metal pattern work, and the machining of a variety of irregular shapes are well known. You can now double or triple these savings by the use of this machine with a three spindle head.

Ideal for patterns, core boxes, permanent molds, bakelite molds, die casting dies, rubber molds, small forging dies, and other jobs with irregular profiles or surfaces which must be produced in multiple.

There are innumerable small jobs, difficult enough to produce singly by ordinary hand methods, which must be made in multiple. The illustrations show a typical example, a core box which must be duplicated many times over in the foundry work applicable to a small automobile.

On the Keller Automatic Tool Room Machine with a three spindle head, three jobs can be reproduced simultaneously from one model. There is a surplus of power in the machine far beyond the requirements of any single small job, and it is easily possible to cut three at once without loss of efficiency. The automatic electric control takes care of that. The cutting time for three pieces may be reduced to the time that would otherwise be taken for one, and the finish left by the machine will be equally satisfactory.

The use of this machine results in tremendous savings on a variety of work for which the single spindle machine would not show a sufficient saving to warrant the investment. Many small molds are customarily hobbed in a solid steel block. It is now economical to mill such impressions on the Keller Automatic Tool Room Machine, dispensing with hobbing altogether or using it only as a finishing operation, greatly improving the life and quality of the tool in either case. The Keller Automatic Tool Room Machine, Type BL, with the three spindle head may also be used with only one spindle operating on a large job requiring the machine's full capacity, or on a job which is not needed in duplicate.

Our regular high speed spindles, constructed with adjustable tapered roller bearings, are used in the three spindle head, and are removable. They have a fixed eight-inch center distance. A locating plate providing the same relative positions for the jobs may be installed readily for extra convenience in set up.

We will be glad to give you complete information and show you what this equipment could do on your work.

PRATT & WHITNEY DIVISION

NILES-BEMENT-POND COMPANY

HARTFORD, CONNECTICUT

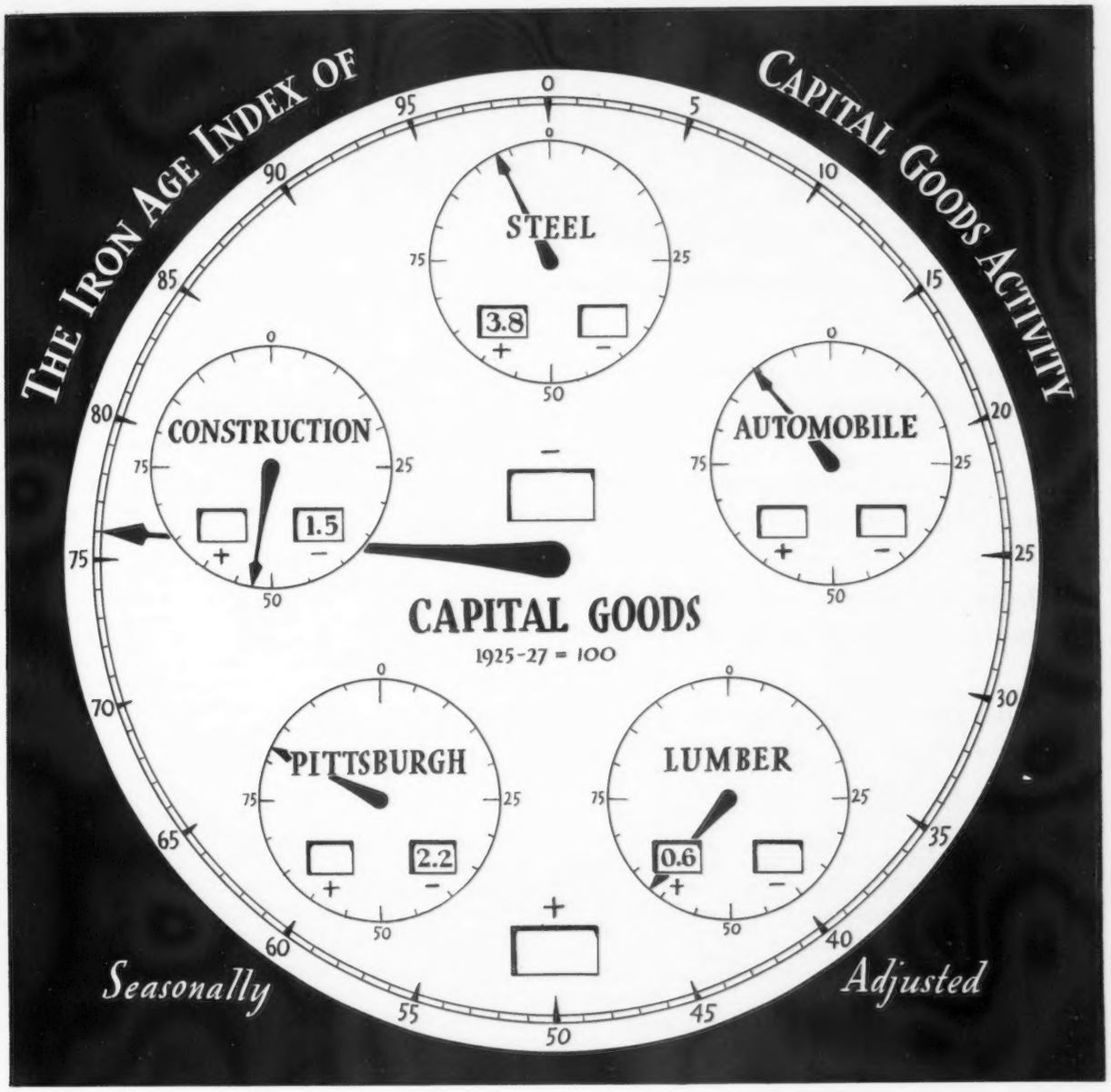
Current Metal Working Activity Statistically Shown

These Data Are Assembled by The Iron Age from Recognized Sources and Are Changed Regularly as More Recent Figures Are Made Available.

Raw Materials:	May, 1936	April, 1936	May, 1935	Five Months, 1935	Five Months, 1936
Lake ore consumption (gross tons)[a]	.....	3,485,293	2,466,585	12,157,235	.....
Coke production (net tons)[b]	.....	3,554,617	2,850,236	14,362,635	.....
Pig Iron:					
Pig iron output—monthly (gross tons)[c]	2,648,401	2,403,683	1,727,095	8,246,486	10,887,986
Pig iron output—daily (gross tons)[c]	85,432	80,125	55,713	54,612	71,631
Castings:					
Malleable castings—production (net tons)[d]	.....	50,954	34,729	204,349	.....
Malleable castings—orders (net tons)[d]	.....	47,933	31,136	194,560	.....
Steel castings—production (net tons)[d]	.....	63,087	30,646	153,260	.....
Steel castings—orders (net tons)[d]	.....	83,188	29,083	152,113	.....
Steel Ingots:					
Steel ingot production—monthly (gross tons)[e]	4,046,253	3,942,254	2,633,661	13,783,987	17,341,490
Steel ingot production—daily (gross tons)[e]	155,625	151,625	97,543	106,031	133,396
Steel ingot production—per cent of capacity[e]	70.91	69.09	44.06	47.90	60.78
Finished Steel:					
Trackwork shipments (net tons)[e]	7,314	7,031	4,228	17,365	28,085
Steel rail orders (gross tons)[e]	8,800	150,057	28,215	252,807	556,148
Sheet steel sales (net tons)[f]	.....	190,269	149,725	1,016,028	.....
Sheet steel production (net tons)[f]	.....	217,975	191,507	1,082,584	.....
Fabricated shape orders (net tons)[g]	.....	101,614	60,448	398,300	.....
Fabricated shape shipments (net tons)[g]	.....	124,044	84,115	413,030	.....
Fabricated plate orders (net tons)[d]	.....	29,900	17,630	81,548	.....
Reinforcing bar awards (net tons)[e]	19,725	26,700	12,080	99,920	162,090
U. S. Steel Corp. shipments (tons)[h]	984,097	979,907	598,915	2,975,891	4,145,285
Ohio River steel shipments (net tons)[i]	.....	74,110	78,106	328,028	.....
Fabricated Products:					
Automobile production, U. S. and Canada[k]	.....	527,726	385,427	1,996,180	.....
Construction contracts, 37 Eastern States[l]	.....	*$234,631,600	$126,720,100	$548,501,600	.....
Steel barrel shipments (number)[d]	.....	730,099	554,102	2,531,234	.....
Steel furniture shipments (dollars)[d]	.....	$1,633,633	$1,214,163	$5,761,399	.....
Steel boiler orders (sq. ft.)[d]	.....	783,961	643,154	2,281,288	.....
Locomotive orders (number)[m]	10	15	2	13	98
Freight car orders (number)[m]	9,677	3,650	2	1,432	22,234
Machine tool index[n]	118.9	125.7	73.3	†67.1	†116.6
Foundry equipment index[o]	.....	134.0	100.7	†94.4	.....
Foreign Trade:					
Total iron and steel imports (gross tons)[p]	.....	49,277	47,719	149,683	.....
Imports of pig iron (gross tons)[p]	.....	11,982	23,174	46,903	.....
Imports of all rolled steel (gross tons)[p]	.....	23,847	18,939	73,294	.....
Total iron and steel exports (gross tons)[p]	.....	301,987	286,599	1,306,247	.....
Exports of all rolled steel (gross tons)[p]	.....	101,522	62,161	345,994	.....
Exports of finished steel (gross tons)[p]	.....	90,116	56,612	304,462	.....
Exports of scrap (gross tons)[p]	.....	190,845	209,425	900,844	.....
British Production:					
British pig iron production (gross tons)[r]	661,000	629,800	558,900	2,643,700	3,105,000
British steel ingot production (gross tons)[r]	963,000	*984,200	853,300	4,031,200	4,778,300
Non-Ferrous Metals:					
Lead production (net tons)[s]	.....	38,073	37,358	159,477	.....
Lead shipments (net tons)[s]	.....	40,457	32,341	168,454	.....
Zinc production (net tons)[t]	44,905	43,252	34,572	175,239	208,785
Zinc shipments (net tons)[t]	43,977	42,311	35,627	185,619	210,833
Deliveries of tin (gross tons)[v]	5,235	6,235	3,950	23,775	29,225

* Revised. † Three months' average.

Source of figures [a] Lake Superior Iron Ore Association; [b] Bureau of Mines; [c] THE IRON AGE; [d] Bureau of the Census; [e] American Iron and Steel Institute; [f] National Association of Flat-Rolled Steel Manufacturers; [g] American Institute of Steel Construction; [h] United States Steel Corp.; [i] United States Engineer, Pittsburgh; [k] When preliminary, from Automobile Manufacturers Association—Final figures from Bureau of the Census; [l] F. W. Dodge Corp.; [m] *Railway Age;* [n] National Machine Tool Builders Association; [o] Foundry Equipment Manufacturers Association; [p] Department of Commerce; [r] British Iron and Steel Federation; [s] American Bureau of Metal Statistics; [t] American Zinc Institute, Inc.; [v] New York Commodities Exchange.



Same Week Last Month	*Preceding Week*	*Last Week*		*Same Week 1935*	*Same Week 1934*	*Same Week 1933*
76.0	**76.0**	**76.0**	**COMBINED INDEX**	**57.5**	**62.0**	**51.0**
86.3	89.7	93.5	Steel Ingot Production	53.1	81.4	65.4
99.0	*89.8	89.8	Automobile Production	82.9	64.9	50.7
56.3	61.4	62.0	Lumber Shipments	47.2	53.8	53.4
82.2	84.1	81.9	Pittsburgh Industrial Production	66.9	73.7	59.0
55.4	*54.7	53.2	Heavy Engineering Construction	37.5	36.2	27.4

*Revised.

WITH steel mill activity out in front, production of capital goods, as measured weekly by The Iron Age's adjusted index, is holding to previous levels. There was no change in the combined index last week, and average operations accordingly remained at 76.0 per cent of the index's base-period average, or "normal." Reports of actual volumes showed a minor recession in automobile output, but the decline was only seasonal and did not affect the adjusted automobile index. The Pittsburgh industrial index, however, dipped downward, and heavy construction activity was another loser. Lumber shipments were higher. Still, the best sign of encouragement was indicated by unusually strong steel mill activity. At a time when there is normally a tendency for operations to be declining, a rise of two points in per cent of capacity operations occurred. This was sufficient to raise the adjusted index of steel production 3.8 points.

Total capital goods activity at this point is running at about the same rate as was established a month ago, but compared with the comparable period last year the present showing is 32 per cent higher.

Components of The Index (1) Steel Ingot Production Rate, from THE IRON AGE; (2) Automobile Production, from Cram's Reports, Inc.; (3) Revenue Freight Carloadings of Forest Products, from Association of American Railroads. (4) Industrial Productive Activity in Pittsburgh District, from Bureau of Business Research of University of Pittsburgh: (5) Heavy Construction Contract Awards, from *Engineering News-Record.*

. . . Republican platform calls for new alinement of political parties.

o o o

. . . Campaign based on principles rather than parties will be most important since Civil War.

o o o

. . . John L. Lewis establishes Pittsburgh headquarters in steel unionization drive.

o o o

. . . Emergency freight surcharges on pig iron, iron ore, coal and coke are reduced by ICC.

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BY L. W. MOFFETT

Resident Washington Editor, The Iron Age

o o o

WASHINGTON, June 16.—Headed by a native Pennsylvanian, born in West Middlesex, Mercer County, in a steel making district, the new standard bearer of the much-liberalized, if not reborn, Republican party, Gov. Alfred Mossman Landon, of Kansas, has been launched as a Presidential candidate on a platform which studiously seeks to draw sharp contrasts to the policies, rather than the platform, of the New Deal. . . . Fundamentally, the Cleveland platform does not greatly differ from the Democratic platform of 1932, except in few instances. . . .

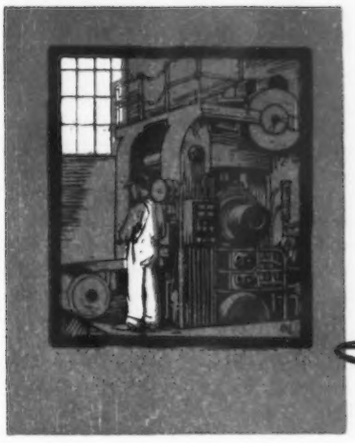
The Republican platform, in a tone of derision, even lifts bodily a phrase from the Democratic platform in its advocacy of "a sound currency to be preserved at all hazards" and takes from the lips of William Jennings Bryan its declaration that "a private monopoly is indefensible and intolerable." . . . At no point does it mention the Democratic party. . . . Throughout it refers to and vigorously castigates the New Deal. . . . The clear implication is that there is no Democratic party, that its policies have been thrown overboard and replaced by a usurping New Deal party that would destroy the American system and transplant an alien system of government, heedless of the constitution and headed for social and industrial regimentation under the dictatorship of an all-encompassing Federal bureaucracy.

Accept the premises as millions do and other millions do not, this is believed to be a fair interpretation of the broad outlines of the Republican party's stand as reflected by its platform, built on compromise. . . . It is a compromise which leans heavily to the progressives and one that sees pretty much the eclipse of what is called the Old Guard. . . . It spells the rise of what is called liberalism in the party and a shift of control to the West from the East. . . .

Certain it is that the party has been re-animated, and, if the Cleveland proceedings are a reliable index, as they apparently are, it has come under skillful leadership, from its new field marshal down. . . . Its changed pattern can be indicated no better than by keeping in mind that its leading team, Governor Landon and Frank Knox, the able Chicago publisher and hard-hitting New Deal foe, who is the vice-presidential nominee, bolted the Republican party in 1912 and became fellow Bull Moosers, carrying the standard of Theodore Roosevelt. . . . So, just as the Republican party can say there is no longer a Democratic party, the latter, in kind, can retort there is no longer a Republican party. . . . And indeed it is perhaps true that, taking the country as a whole, the spirit of orthodox partisanship has largely vanished, except in certain sections. . . . Actually, too, this trend is seen and encouraged by leaders of the opposing sides as seen by their increasing appeal for votes for principles they affect to espouse rather than for simply party votes. . . .

The fact that the Republican party chose as its leaders two outstanding men from the Middle West, now lifted to national fame, shows that it considers that the chief battleground lies in the West, roughly but inaccurately called the agricultural sections. . . . Its Landon-dominated platform itself is symbolic of this fact. . . Partially it reflects less emphasis than heretofore on what is called the industrial East and greater emphasis on the so-called agricultural section, a move that is generally considered to denote a politically wise strategic move. . . . This is because it is plainly a challenge to meet the strong appeal of the New Deal, with its huge outpourings of money to the farmers for following the New Deal-dictated policy of scarcity, theoretically knocked out by the Supreme Court's AAA decision, but really circumvented under the subterfuge of a soil conservation policy. . . .

While in its aggressive campaign, which Governor Landon has promised, the Republican party obviously will appeal to industry and business for votes, it apparently feeling much more certain of overwhelming support from this source



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than it is of support from the majority of the agricultural electorate, offered abundant production and subsidies on exports. . . . It counts on support from business and industry by reason of the principles of "free enterprise, private competition and equality of opportunity" with a minimum of Federal regulation as against regimentation, Government competition and attacks on business. . . .

As a means of reemployment in industry and agriculture, the Republican platform proposes removal of restrictions on production, abandonment "of New Deal policies that raise production costs, increase the cost of living and thereby restrict buying, reduce volume and prevent reemployment" and "encouragement instead of hindrance to legitimate business." . . .

Federal bureaucracy controlling relief would be scrapped and the job turned over to non-political agencies. . . . Security would be established on a basis of production under free enterprise and would be operated under a policy of pay-as-you-go with Government and state aid for those over 65. . . . Labor, whose votes, together with those of agriculture, are so heavily depended upon by the New Deal for reelection, would under the Republican platform be assured the right to organize and bargain collectively "through representatives of its own choosing without interference from any source." . . . The phrase, "without interference from any source," meets with strong opposition from organized labor which barred its insertion in the Wagner-Connery Labor Disputes Act. . . . Industrialists had asked that the phrase be incorporated in the act. . . . "Any source," organized labor firmly has in mind, includes organized labor itself and it successfully insisted upon the right to interfere while denying a similar right to employers. . . .

Responsive to the unpopular Supreme Court decision holding unconstitutional the New York minimum wage law for women and children, the platform goes on record for state-controlled maximum hours and minimum wages for children and women and asserts the belief that such protection can be had within the constitution—Governor Landon said that if it cannot be accomplished within the constitution, then he favors a constitutional amendment so that it can be done. . . . Organized labor appears to be split on the issue. . . . President Green of the American Federation of Labor favors state-controlled minimum wage laws for women and children but not for men. . . . This harks back to the traditional Federation stand, laid on the shelf under NRA, which opposed legislative fixation of minimum wages on the theory that the minimum wages would become maximum wages and destroy the power of labor to bargain, and on the further theory that control of wages would also mean control of labor. . . . The John L. Lewis crowd favors state laws for all minimum wages and thereby probably reflects the prevailing, though far from unanimous national, sentiment.

Rather surprisingly, the platform flatly declares for repeal of the reciprocal tariff law, which is blasted as being "futile and dangerous" with destructive effect on agriculture and industry. . . . No doubt the prime moving force back of this declaration was the belief of the Cleveland convention that the law has widespread farmer opposition, coupled with a divided sentiment in industry. . . . Probably the commonly accepted view in Washington that the act was generally popular with the majority of both agriculture and industry was unconsciously based on the ardent advocacy of the act by New Dealers, though it has the support also of such organizations as the Chamber of Commerce of the United States. . . . Nevertheless it has been attacked by numerous industries and the steel industry has complained of reduced duties proclaimed under reciprocal agreements. . . .

The Cleveland platform takes up a common complaint when it condemns "the secret negotiation of reciprocal trade treaties without public hearing or legislative approval. . . . Evidently its use of the word "treaties" is significant and is designedly used instead of the New Deal word "agreement" for treaties require Senate ratification, whereas the "agreements" are negotiated exclusively by the State Department and proclaimed by the President. . . . Thus the platform once again strikes at executive usurpation of legislative power, though it reflects inconsistency in urging return to the principle of flexible tariffs, instituted under the Harding Administration. . . . Under this principle the Chief Executive could reduce or increase duties by a maximum of 50 per cent without Congressional approval, though open hearings before the Tariff Commission prior to making changes in duties were required. . . .

Much, and with good reason, will be made of the declarations in favor of restoring the civil service and against "shameful waste and general financial irresponsibility," charged with piling "deficit on deficit" and with threatening "national bankruptcy and the destruction through inflation of insurance policies, bank deposits and savings bank deposits." . . . Under this plank on Government finance, the convention made a particularly strong appeal to business and industry. . . . It pledged an end to "the folly of uncontrolled spending," a balanced budget, "not by increasing taxes, but by cutting expenditures drastically and immediately"; use of the taxing power "for raising revenue and not for punitive or political purposes"; a sound and stable currency "to be preserved at all hazards"; no further devaluation of the dollar, and restoration to Congress of its authority to coin money and regulate its value by repealing laws giving this authority to the Executive." . . .

While in spots the platform lapses into generalities and ambiguities, common to all political platforms, these really are characterized by their rarity . . . and the upshot as a whole is a plain, understandable document. . . . As Woodrow Wilson was wont to say of the Baltimore Democratic platform, Republicans say the Cleveland platform is not molasses to catch flies. . . . They insist it will be adhered to because Landon keeps his promises. . . . To this they attribute much of his popularity which was so great that he rode above the New Deal landslide in 1934 and into the Governor's chair. . . .

Probably for the country at large Landon is best known for his rigid economy in government, commensurate with relief requirements, and for his success in maintaining a balanced budget, a difficult task in the trying period of depression during which he has held office, regardless of the Kansas law requiring such a fiscal policy. . . . Landon's successful business experience in the oil industry also had gained him prominence beyond the range of Kansas and Oklahoma and the surrounding section of the country. . . .

Friend and foe alike will watch with keen interest his conduct of a campaign, which, because of the principles involved, is considered to be the most important since the Civil War. . . .

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Lewis Leases Pittsburgh Headquarters for Steel Unionization Drive

Leasing the 36th floor of the Grant Building in Pittsburgh and naming a partial list of members of the Steel Workers' Organizing Committee, which will hold its first meeting Wednesday in Pittsburgh, John L. Lewis, chairman of the

Committee for Industrial Organization, has announced plans for organizing the steel industry, the magnitude of which task he has recognized. In announcing the plans last Friday, Mr. Lewis said:

"It is intended to prosecute a vigorous and efficient campaign of organization throughout the whole industry. Reports indicate tremendous interest and high enthusiasm among the workers in the industry who are looking forward to the enjoyment of the rights of industrial democracy which have hitherto been denied them. Likewise, tremendous public interest in the purpose of the campaign is being evidenced.

"The supporters of this great movement have no desire to discount the magnitude of the task or the possible opposition of the financial interests represented in the steel industry. Nevertheless they believe that neither the corporations engaged in the manufacture of steel nor those in any other industry, whatever their attitude or whatever course they pursue, can long continue to withhold from American workmen the privileges which are theirs by every moral and legal precept.

"The right to organize and bargain collectively, and thus be enabled to voice his grievances and state his ideals, is the right of every citizen under the public policy of the United States."

Heading the Steel Workers' Organizing Committee is Philip Murray, vice-president of the United Mine Workers of America. David McDonald, Pittsburgh, was named secretary-treasurer. Associate members of the commitee, "for the present," include the name of M. F. Tighe, president, Amalgamated Association of Iron, Steel and Tin Workers, showing that he is going along with the C. I. O. The absence of his name from the C. I. O.-Amalgamated agreement is said to have been due to his illness. Other members, chosen from industrial unions, are: Julius Hochman, vice-president, International Ladies' Garment Workers' Union; Joseph K. Gaither, vice-president of the Amalgamated Association of Iron, Steel and Tin Workers; Leo Krzycki, vice-president of the Amalgamated Clothing Workers of America; John Brophy, director of the C. I. O., and P. T. Fagan, president, District 5, United Mine Workers.

Clinton S. Golden, formerly regional director of the National Labor Relations Board, was named regional director for the Pittsburgh area in charge of field activities, and Van A. Bittner, staff representative of the United Mine Workers, was named regional director in charge of the field activities for the Chicago area. It was stated that other regional directors will be named.

Vincent Sweeney, formerly with the Scripps-Howard Newspaper Alliance, was made director of publicity, attached to the Pittsburgh headquarters and Lee Pressman of Liebman, Robbins & Pressman, 50 Broadway, New York, was named as general counsel for the committee.

Labor Election Ordered At Nickel Plant

The National Labor Relations Board has ordered a secret election among the 1137 production employees at the Huntington, W. Va., plant of the International Nickel Co., Inc., to determine whether the workers wish to be represented by Square Deal Lodge No. 40, Amalgamated Association of Iron, Steel and Tin Workers or the Employees' Council.

The lodge claims a membership

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of 625 employees, a majority, while the company, according to the NLRB, has taken the position that the Employees' Council is also entitled to represent the employees. It was stated in the NLRB announcement last Friday that the election would be conducted within the next 20 days by Ralph A. Lind, Cincinnati regional director.

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Spain Imposes Import Surtaxes

Under a decree made effective May 30, Spain imposed import surtaxes ranging from 5 to 20 per cent on approximately 1432 of the 1540 items in its tariff, according to a cablegram received by the Department of Commerce from Ambassador Claude G. Bowers, Madrid.

Among items taking a 5 per cent surtax are "certain iron bars" and plates. Included in the list made subject to a 10 per cent surtax are metal barrels, iron and steel furniture, copper and nickel in ingots, scrap, milling and textile machinery, agricultural machinery and printing machines.

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Aircraft Production Up Sharply In First Quarter

Continuing the upward trend which began in 1934, production of aircraft in the United States in the first quarter of 1936 rose 33 1/3 per cent over that for the corresponding period of last year, according to figures announced by Eugene L. Vidal, Director of Air Commerce, Department of Commerce.

The total of all aircraft manufactured in the United States in the first quarter of the current year was 456 compared with 349 for the same period of 1935. The most noticeable increase in any one category was a 28 per cent jump in the manufacture of light airplanes of the private-owner type. The major increase in this classification was in the number of two-place cabin land monoplanes, the output for the first quarter of 1936 being 100 compared with 45 in the corresponding period of last year.

Of the total production of all kinds of aircraft in the first quarter of the present year, 216 were for domestic civil use, 173 were delivered to military establishments and 67 were exported. There were 36 companies or individuals producing airplanes for domestic civil use during the first quarter of 1936 and of these eight manufactured approximately 74 per cent of the total designed for civil use.

Upswing in Building Activity

Reports to the Department of Commerce give evidence of an upswing in building activities. Building permits issued in May in 100 representative cities totaled $63,829,408 compared with $36,254,262 in the same cities in May of last year, a gain of 76.06 per cent. While these tabulations represented largely activities in the big cities the reports from smaller places in widely scattered areas gave a cross-section of the general upward trend.

New York City led all centers, the volume of permits being $13,685,092 compared with $3,367,062 in May of last year. In Los Angeles the volume increased to $5,333,114 from $2,473,064. The first 10 cities in volume of permits issued in May ranked as follows: New York, Los Angeles, Detroit, Philadelphia, Buffalo, Washington, San Francisco, Rochester, N. Y., Chicago, and Miami, Fla. The increase in building activities in these 10 cities was 80 per cent.

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Freight Surcharges on Iron, Ore, Coal and Coke Reduced

Railroad and rail-water surcharges on pig iron, iron ore, coal and coke were ordered reduced by the Interstate Commerce Commission in its decision June 12, which granted continuance of emergency freight rates after June 30, the date originally fixed for their expiration. Railroads had asked that the charges, which went into effect April 18, 1935, be made permanent.

The maximum charge on pig iron was reduced to 25c. per gross ton. The present maximum surcharge is 2c. per 100 lb., or 44.8c. per gross ton. The maximum charge of 15c. per ton on coal and coke was reduced to 10c., and the charge on iron ore was reduced from 10c. to 8c. per net ton. On iron pyrites the maximum charge was reduced to 1c. per 100 lb., while charges on ores and concentrates "not otherwise indexed" were removed. A number of other rates were also removed or reduced.

The commission majority, in permitting continuance of the surcharges to Dec. 31, 1936, said they "were not convinced that the emergency charges constitute an undue burden upon the traffic upon which they are imposed or upon the shippers or receivers of such traffic," but the carriers were told that "these charges cannot be regarded as a permanent remedy." Commissioner Aitchison, dissenting in part, and joined by Commissioners Porter and Tate, said the surcharges should have been allowed to expire on the date originally set by the commission and declared that the extension granted was "counter to the mandates of the Interstate Commerce act."

Yields from surcharges for the first 12 months of their application were estimated by the railroads at $104,579,000. The estimated yield from iron and steel, etc., was $3,893,822; iron ore, $2,994,809, and bituminous coal, $17,447,732.

The average emergency charge on bituminous coal was said to be about 12c. a ton. The greatest opposition to continuance of charges came from coal producers. Opposition to the continuance of the emergency charge of 10c. per net ton on iron ore was voiced by producers of such ore mined in Minnesota, Michigan and Wisconsin, by the State Conservation Commission of Minnesota and by certain consumers located at points on Lake Erie.

Steel manufacturers having plants at or near the Lower Lake ports strongly objected to continuance of the single charge on iron ore handled by Lake. It was their position that where there is but one rail haul the charge should be lower than where there are two, that the single charge of 10c. on ore receiving no second rail haul is unreasonable and that it is prejudicial to them and preferential of competing steel manufacturers whose ore receives two hauls. Other manufacturers at inland points took the opposite position, urging that if any charge of ore was to continue, it should be applied as heretofore. The commission said that the charge applicable to iron ore, like that applicable to coal, appears disproportionately large and accrues to considerable extent to certain carriers which are not in need of additional revenue, particularly the Duluth, Missabe & Northern. Coke charges were reduced because coke is competitive with coal. The new 10c. rate on coal is to apply to Lake cargo and tidewater coal in the same manner that the 15c. charge is applied.

In ordering reduction of the maximum charge on pig iron to 25c. per gross ton, the commission said that certain manufacturers pointed out that, as to many rates, this produces a charge greater than that which the railroad originally proposed and that in some instances long-haul shippers are under a disadvantage in relation to short-haul shippers.

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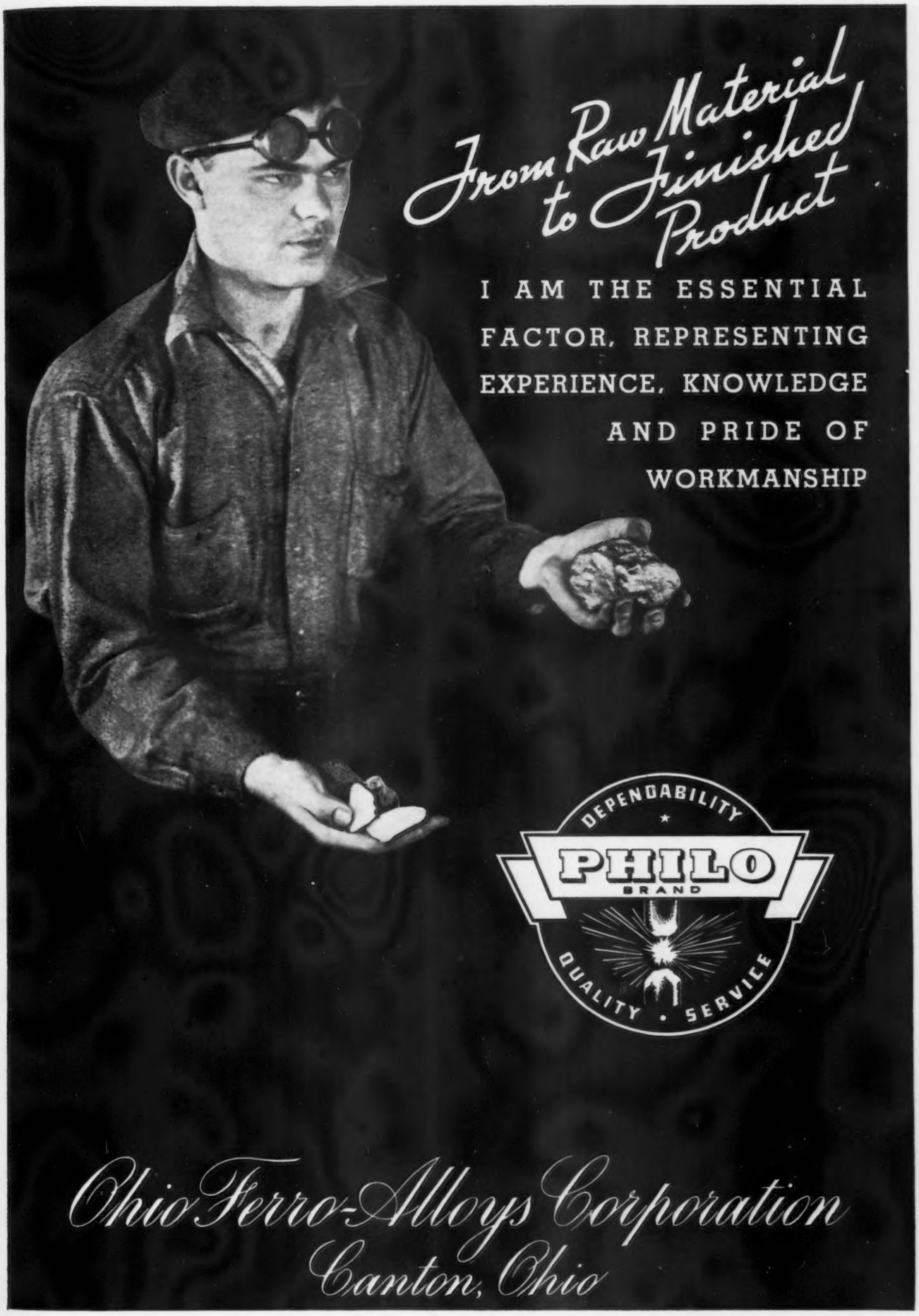
Railroads to Study Air Conditioning

Plans for an intensive study to determine what improvements, if any, can be made in present passenger car air-conditioning systems and how far they can be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standardized so as to reduce costs of installation, have been announced by J. J. Pelley, president, Association of American Railroads. The study will be conducted by L. W. Wallace, director of the equipment and research division of the association. Study of the general subject has been under way for some months, but in order to obtain definite data as to the efficiency of the various air-conditioning devices now in use in passenger cars, 30 railroads have been asked to assign engineers for the next three months in order to aid in this research work.

Loan For Liner Construction To Be Postponed

Upon representation by the United States Lines Co. that more than one shipyard will, on Sept. 15, be ready to quote a firm price on a new vessel for the company, Secretary of Commerce Roper has announced that action on the construction loan application for the building of a trans-Atlantic liner similar to the Manhattan and Washington will be deferred until Sept. 30.

The United States Lines originally agree, in return for permission to lay up the Leviathan, to build the new ship, but thus far, it was stated, has been unable to obtain a bid from more than one builder. Secretary Roper said the company now has reported that it has "reason to believe that at least three yards are now in a position to quote a firm price" by Sept. 15.

LETTERS TO THE EDITOR

Finds No Fault with Properly Detinned Scrap

Editor, The Iron Age:

THE paper on the "Technical Importance of Iron and Steel Scrap," by Clyde E. Williams, director, Battelle Memorial Institute, Columbus, Ohio, which was presented at the recent meeting of the American Iron and Steel Institute and printed in abstract form in THE IRON AGE, May 28, page 34, provoked the following interesting comment from Alfred C. Buttfield, vice-president, Vulcan Detinning Co., Sewaren, N. J.:

It seems to us that Mr. Williams may have unintentionally created a wrong impression regarding the amount of tin coming from detinned scrap in putting detinned at the head of the list when he says: "Undoubtedly, most of it (tin) comes from the large amounts of detinned scrap used in the open-hearth charge, to poorly detinned or often untreated tin plate scrap or to old tin cans or other utensils charged in the open-hearth or in the cupola or blast furnace."

During 1934 less than 200,000 tons of tin plate scrap were treated by American detinning companies. Taking Mr. Williams' figure of 16,000,000 tons of scrap used in the basic open-hearth, the ratio of detinned scrap to other scrap would be less than 1 to 80. Assuming 50 per cent scrap in the charge, and a tin content of 0.01 per cent in the finished steel, it would be necessary for the detinned scrap to contain 1.6 per cent tin if all the tin in the finished steel were attributed to the detinned. As the tin plate contains only about 1½ per cent tin before detinning, this is manifestly impossible.

Of course this is a somewhat exaggerated picture as all steel producers do not use detinned. Basing our figures on a more likely case, let us assume a charge consists of 50 per cent pig iron, 30 per cent scrap other than detinned and 20 per cent detinned. Since an outlet for their scrap is essential to recognized detinners, every care is taken to see that the material is as low in tin as possible. Detinned scrap produced by such concerns contains from 0.03 to 0.08 per cent, a fair average being 0.06 per cent tin. On this basis, the finished steel would contain only 0.012 per cent tin if all materials other than the detinned scrap were tin free.

As a matter of fact, many steel products, which eventually find their way into the scrap pile, contain substantially the same percentage of tin as does detinned scrap, as shown by the following:

Black scrap — sample 1 — 0.025 per cent.

Black scrap — sample 2 — 0.056 per cent.

Structural steel shape—producer 1—0.036 per cent.

Structural steel shape—producer 2—0.044 per cent.

We believe that far more tin comes from the other sources mentioned by Mr. Williams than from detinned scrap. Some years ago this company received a complaint from a large user of detinned, the substance of which was that some of their heats were high in tin and that the detinned must be at fault. An investigation showed that tin plate scrap (not detinned) produced in its own plant was being charged into the open-hearths. In another case it was found that through collusion between an unscrupulous dealer and a steel mill employee, tin plate scrap was being sold as black scrap and was being used in the open-hearth charge.

While we have no definite knowledge that such is the case, it seems very probable that considerable

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quantities of terne plate scrap and old tin cans (not detinned but sometimes burnt to disguise this fact) find their way into various steel plants. Due to the solder used on the seams, an old can may contain over 30 times as much tin as will detinned scrap.

We have always maintained that scrap from recognized detinning plants, in view of its compactness, uniformity, the high quality of the steel itself and its comparative freedom from residual metals other than tin, is one of the best grades available for open-hearth use. This is confirmed by over 20 years' continuous use of detinned scrap by one of the largest steel producers in this country.

Mr. Williams' Reply

In his reply to Mr. Buttfield, Mr. Williams took occasion to correct any false impression he may have given as to the utility of detinned scrap for making steel. Mr. Williams' letter follows:

Editor, The Iron Age:

I am very glad to correct any false impression my paper may have given as to the utility of detinned scrap for making steel. Properly prepared detinned scrap is an excellent grade of scrap for the open-hearth, and when used in the customary proportions, does not introduce sufficient tin to affect the quality of the steel.

The statement in question is that "most of the tin in steel *has come* from the large amounts of detinned scrap used in the open-hearth charge, to poorly detinned or often untreated tin plate scrap or old tin cans or other utensils charged in the open-hearth or in the cupola or blast furnace." I did not say that it "*comes from*" as quoted by Mr. Buttfield but "has come from."

Using Mr. Buttfield's estimate that detinned scrap contains on the average 0.06 per cent tin and his figure of 200,000 tons for the amount of tin plate scrap detinned in 1934, this amount of detinned scrap used in making basic open-hearth steel would have increased the tin content of steel by 0.0007 per cent. While this is a small quantity, it is an increment which is added each year, and it has undoubtedly contributed a great deal to the tin content in the scrap now coming back to the open-hearth. The other sources of tin mentioned in my paper, i.e., poorly detinned or untreated tin plate scrap, old tin cans, non-ferrous alloys and galvanized scrap have contributed an important amount of tin. It is the use of these forms of scrap that I cautioned against in the latter section of my paper.

Vox Populi, Pro and Con

Editor, The Iron Age:

I have just read your editorial in THE IRON AGE of June 4, and I am glad to note that you are not worried about criticism contained in the letter written you by Mr. G.

With the authors of the New Deal using the taxpayers' money to the extent of five billion dollars to carry out their program, I think it is the duty of all good journals, of which yours is one of the best, to endeavor to offset specious arguments that they are continually putting out in their endeavor to continue their regime. I am sure that if you lose a few poor "deluded" subscribers, they will be

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Editor, The Iron Age:

We note in your June 4 issue criticism of the articles written by J. H. Van Deventer. There are fanatics in every walk of life who shudder at the truth and resent the searching of sunlight into their wanderings in a forest of fallacies. These editorials are resented because they cannot be refuted and I am sure that for every objection on the part of your readers there will be a thousand amens.

I have always cut out this page and given it to the president of our bank who very frequently reads them to the Board of Directors and some of them have been republished in some of the local papers.

Editor, The Iron Age:

Your editorials have our endorsement to the fullest extent.

We believe the future of all industries and the living conditions of our people are far more important than the rantings of a few "More holier than thou," disturbers who by their mischief (you know they are always with us) cause trouble.

Speaking of deluded minds and junk, we believe you and thousands of your subscribers are very certain, from a practical viewpoint, just what deluded minds and junk have been doing within the last three years to destroy that which has been fought for and which will be continued to be fought for by millions of others who have learned their lesson by experience and not by radical theories.

Editor, The Iron Age:

I have read your editorials published in THE IRON AGE for a long time, and have greatly admired your frankness in stating the facts as everyone with any vision can see them.

I'm stronger for you than before since reading your editorial in the June 4 issue. Some people prefer being ignorant particularly when politics are involved.

Editor, The Iron Age:

Referring to your editorial of June 4 and the comment on previous ones from one of your readers.

The writer's opinion won't make any difference, of course, but he would like to compliment you on the forcefulness of these editorials during the whole New Deal period.

The preservation of the Constitution is much more important than running a good trade paper, and your critic apparently fails to realize the ultimate result of New Deal ideas.

Editor, The Iron Age:

Just received a copy of your June 4 issue. You certainly hit the nail on the head with your editorial in this issue. Please keep up your good work, as we surely need something to get the people on a sound basis again and not the flowery speeches from the New Deal.

Editor, The Iron Age:

I have just read your editorial in the June 4 issue of THE IRON AGE.

It is very difficult for one of my ability to comment on a work that has shown so much evidence of good keen thought as your editorials; nevertheless, I believe I am speaking for each and every member of our organization when I say "more power to you."

This editorial is very timely and will be posted on our bulletin boards as have been many of your previous editorials.

Editor, The Iron Age:

Thanks for your very good editorial of June 4, and please keep

1800 lb. rolls—20% down grade—30 seconds apart—cars to be returned! Done with a special 6″ pitch Baldwin-Duckworth chain.

This job, developed and installed by the Engineering Products Company, in the "Chicago Tribune" plant, is typical of hundreds of unusual conveying installations that employ Baldwin-Duckworth chain for steady and reliable operation. We can't illustrate them all—even in our catalog—but our engineering department draws on the experience behind them every time a design is developed for a new job—maybe such a job as you are thinking about right now! Baldwin-Duckworth Chain Corporation, Springfield, Mass.

BALDWIN-DUCKWORTH

right on with the good work you have been doing each week.

Evidently your friend is a "New Dealer," and if the New Deal is kept in office he will be a pretty sour lemon some time in the next four or five years, and of course we will have to suffer also.

Your editorials are wonderful and we sincerely hope they are reaching all over the country and that many people are reading them.

Editor, The Iron Age:

I make no practice of writing fan letters but after reading the criticism by Mr. G. referred to in your editorial of June 4, I am constrained to say to you that I, as a reader of your trade journal, am intensely interested in your editorials, and I feel the machinery industry as a whole is benefited by the attitude you have taken in endeavoring to protect them by open public criticism from the dangers concomitant with the present Federal administration.

To reverse Mr. G.'s attitude, if you do not proceed in writing "this kind of stuff" I would then consider canceling our subscription.

Let me add that your editorials are the finest I have ever read, clear, concise and effective, and in fact it is the first thing I look for in your magazine where previously prices or technical matters had been more important.

Editor, The Iron Age:

I have just read your editorial in the June 4 issue of THE IRON AGE, and immaterial of what Mr. G. said in his letter, I hope that you will do in the future what you did in the past, and what you say in your editorial is your plan, namely to continue doing just this thing until the people decide to accept or reject this "Crying to Heaven" New Deal.

It may be a hard job to defeat F. Deficit R. but I still believe it can be done if everybody puts his shoulder to the wheel, takes his coat off and pushes. I can assure you that my coat is off, and I believe strong editorials like yours in the industrial press will also be helpful. I cannot imagine anything that would be of more importance or of greater value than doing this very thing.

Editor, The Iron Age:

I have long been hoping to find something in your editorials besides attacks on our government. The letter of Mr. G., published in your issue of June 4, expresses my sentiments exactly.

The title of this editorial indicates to me that your line of reasoning is obsolete in other things than economics and politics. You do *not* need and should *not* use a "grindstone" to sharpen an axe today.

Ask the Kelly Axe Co. or consult your own advertising columns.

Editor, The Iron Age:

Please tell Mr. Van Deventer that for every reader who is so small as to be annoyed by his editorials there are hundreds who recognize the truth in print and greatly appreciate these antiseptic jets of caustic which he sprays from time to time on the New Deal ulcer. What this country needs is more Van Deventers.

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HEAVY DUTY
INDUSTRIAL CONTROL
For Standard and Special drives in all classes of Industry.
Automatic Roller and Catcher Tables for 2-High and 3-High Mills.
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Continuous Annealing Furnaces.
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The above just gives you a fair idea of our activity. We have a complete line of A.C. and D.C. Brakes, Flexible Couplings, Automatic Control for Pumps, Fans and other Building Equipment.
Our Catalogue is interesting and is yours for the asking.
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CLEVELAND, O.

Schenectady Stages Gala Event Commemorating Electrical Half Century

CITIZENS of Schenectady on June 12 and 13 staged an impressive program of varied events in commemoration of the 50th anniversary of the establishment in that city of the Edison Machine Works, now the General Electric Co.

The program commenced on Friday afternoon with impressive ceremonies dedicating a monument of native stone to E. W. Rice, former president of the General Electric Co. and a noted electrical pioneer. At the same time the name of Dyke Road, on which the monument stands, was officially changed to E. W. Rice Road.

At 7 p.m. a formal dinner was held at the Van Curler Hotel. It was attended by some 500 guests, among them being a number of the original Edison Pioneers, who collaborated with the great inventor in his early days at Schenectady. Dr. Dixon Ryan Fox, president of Union College, was the toastmaster and introduced, among other distinguished speakers, Owen D. Young, chairman of the General Electric Co.; Charles A. Edison, son of the inventor; William S. Barstow, and Dr. George R. Lunn.

One of the features of the banquet program was the lighting of the new sodium lamps which form the new illuminating system of the Schenectady-Albany road. This was spectacularly accomplished by activating one of the original Edison bi-polar generators, current from which lit a replica of Edison's original lamp. The rays from this, through a photo-electric cell and relay, threw into action the new highway lighting system.

A Mardi-Gras celebration in the public square opposite the hotel followed the banquet.

The events continued on Saturday and comprised athletic contests, open house at the General Electric Co. and fireworks in the evening.

Speaking at the banquet on Friday evening, Owen D. Young eloquently stated his belief in the economic efficacy of confident effort as contrasted with pessimistic realism.

"The heart of this realistic philosophy," said Mr. Young, "seems to be that what is—is, and what is not—can't be; that our problem is to divide what we have and be content; that youth can no longer look forward to the progress which the past has known, that the research workers, the inventor and the engineer are enemies rather than benefactors of society; that we must surrender our visions and our hopes for the drab treadmill of a living in which the talented and untalented alike,

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the industrious and the lazy, the courageous and the cowardly shall have equality in recognition and division. If this occasion has any significance for the future, Mr. Chairman, it is to deny that such alleged realism is real at all. It would be more correct to say that what is—is not, and what is not—will be.

"Broadly speaking, there has not been a time during the past 50 years when anything manufactured by the General Electric Company was not, to some extent at least, obsolete by the time that it was put in service. So rapidly came invention and improvement, fostered by research, that in this growing art it could never be said and cannot be said today that what is—is. It could only truthfully be said that what is—is not, in the sense that what is, is too obsolete ever to be built again. The statement is also equally false that what is not can't be. The whole history of the 50 years shows that what is not—can be, and will be. Such is the craving of the human mind to solve the unknown; such is the human desire to make visions come true; such is the all-conquering spirit of men of this nation that their children shall have what their fathers lacked and wanted. This philosophy of an alleged realism and pessimism is the cause of most of the political, social and economic troubles of this day. It retards production and so employment. It retards distribution and so employment. It retards consumption and so employment. It retards credit and so employment. It retards confidence and so employment. It retards goodwill and breeds irritation and restlessness. It retards vision and so destroys hope. It retards the exercise of the very energies, and all of them, which created the things we celebrate tonight. It is not what is today for which we plan, it is what will be tomorrow, and what tomorrow will bring depends upon our spirit of approach today."

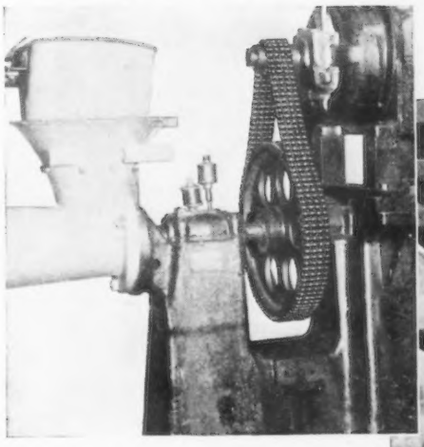
Milwaukee Repeals Boncel Ordinance

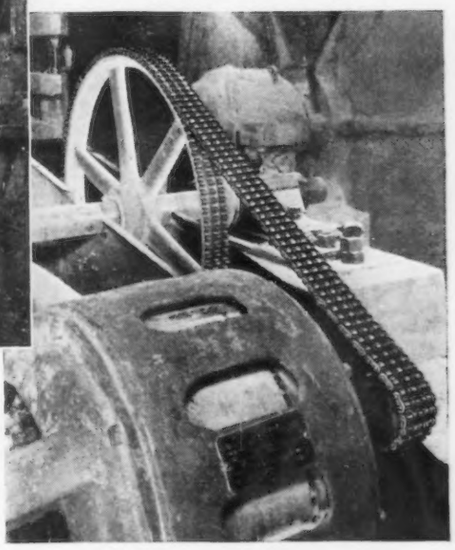
AMONG the first major acts of the new Common Council of Milwaukee, following the spring election at which the former Socialist majority was reduced to a small minority, has been to repeal the so-called Boncel ordinance, enacted about a year ago to empower the mayor and chief of police to close any strike-bound factory in the interest of public safety. The power never was exercised. The ordinance was repealed by a strict party vote of 22 non-partisan to 5 socialist aldermen. This alinement insured repeal whether or not the Socialist mayor, Daniel W. Hoan, saw fit to veto the repealer. Commenting upon the repeal, William C. Maas, president of the Milwaukee Association of Commerce, said:

"The council's action is a step in the right direction. Industry now can proceed with the knowledge that it will not be interfered with by this constant threat. Industry has been kept out of Milwaukee due to this ordinance. With it removed from the city's books we now can go ahead with plans for attracting business here. Trade papers which have commented adversely on this ordinance now will be in a position to give Milwaukee some helpful publicity, realizing that a serious barrier to development has been removed."

A GOOD WAY TO TELL THE MODERN MACHINE . . . AND THE MODERN PLANT

Look for the Diamond ◇ Trade Mark





IN BOTH CASES ANTI-FRICTION, POSITIVE DRIVES ARE USED

EVERY user and every maker of machinery knows of the freer, smoother motion of shafts mounted on anti-friction roller bearings. Power is saved at each bearing.

In the same way—a greater proportionate saving of all the power from the *motor to the machine* or group of machines is made by carrying this power on the anti-friction, roller-bearing type Diamond Roller Chain.

Makers of modern high efficiency machinery—and manufacturers looking for lower power costs and higher production—are using Diamond Positive Motor Drives in a constantly increasing measure.

Careful purchasers of machinery won't countenance drives that slip and thus lower production speeds . . . A good way to be sure, is to see that "Diamond" is specified for all motor drives. Stocked for your convenience in 45 cities. DIAMOND CHAIN & MFG. CO., 433 Kentucky Ave., Indianapolis, Ind. *Offices and Distributors in Principal Cities.*

DIAMOND MOTOR DRIVES

THE EFFICIENCY OF MOTORIZED MACHINERY DEPENDS ON THE DRIVES

CHARLES P. KNUPFER, for many year European sales manager for the Carborundum Co., Niagara Falls, N. Y., has been appointed general sales manager of the company. He has had a long association and wide experience in directing the sales of the company's products in practically all markets of the world. He will make his headquarters at the main office of the company at Niagara Falls.

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RAY C. SKEEL, plant engineer at the Cleveland plant of the Truscon Steel Co., has been transferred to the Youngstown plant in the same capacity. L. B. SCHUMACHER, formerly with Jones & Laughlin Steel Corp., in the reinforcing steel bar sales department, is now with the Truscon company in a similar capacity. A. J. YOUBER has been appointed sales manager at Birmingham, succeeding W. H. STEWART, who has been transferred to the St. Louis territory.

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ALBERT R. KENNEY has been appointed vice-president in charge of sales for Egan, Webster & Co., Pittsburgh. He was formerly sales manager of the company. The offices of the company were recently removed from the Grant Building to the Koppers Building, Pittsburgh.

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F. P. SHEPHARD, for the past nine years sales engineer in the Chicago office of Haynes Stellite Co., has been appointed district sales manager of the Cleveland office of the company, to succeed the late W. A. Moore. Mr. Shephard has been associated with the cutting tool industry for more than 20 years.

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S. C. DUTOT, who has been engaged in sales activities with the Electro Metallurgical Sales Corp. in New York and Chicago for the past 12 years, has been appointed Chicago district manager of the company. He has been identified with the ferroalloy business for more than 20 years. Prior to 1924 he was employed as chemist at the Niagara Falls plant of the Electro Metallurgical Co. R. E. BROWN, who joined the Electromet organization in 1920 soon after his graduation from Lehigh University, has been made district manager of the San Francisco office.

H. C. MCELHONE, for the past five years attached to the office of the president of Westinghouse Electric & Mfg. Co., East Pittsburgh, has been appointed assistant to the vice-president of the company. He has been identified with the company since 1919 in various capacities, in the works, headquarters sales, stock control and executive departments.

C. P. KNUPFER

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CHARLES H. STAMM, for many years an executive with the Empire Sheet Corp. and its successor, the Empire Sheet & Tin Plate Co., Mansfield, Ohio, has resigned to become associated with the Newport Rolling Mill Co., Newport, Ky.

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JULIAN L. SCHUELER, superintendent of the steel and wire division of the Continental Steel Corp., Kokomo, Ind., has sailed for England to attend the Chemical Engineering Congress in London.

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WILLIAM P. EWING, general sales manager of the Superior Steel Corp., Pittsburgh, has been named executive vice-president. L. W. BRIGGS, who has been sales manager of West Leechburg Steel Co., has been made vice-president in charge of sales, and DAVID PRYDE has been appointed vice-president in charge of operations of the Superior company.

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F. D. BAKER, who has had an extended experience in the sale of grinding machinery, has been appointed district representative in central and northwestern Ohio for the Bridgeport Safety Emery Wheel Co., Bridgeport, Conn. He will be located at 17,545 Madison Avenue, Lakewood, Ohio.

FRANK W. TUFTS, formerly of the Detroit Steel Products Co., has been appointed sales promotion and advertising manager of the Continental Steel Corp., Kokomo, Ind.

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WILLIAM J. SULLIVAN, formerly identified with the United States Steel Corp., New York, has been elected vice-president and director of Harvester Metal, Inc., Empire State Building, New York.

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NORMAN B. MCKINNON, formerly of the Pittsburgh office of the Charles Bruning Co., Inc., has been made manager of the newly-opened Kansas City branch of the company.

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GEORGE H. WALSH has been appointed sales representative in western New York by the American Foundry Equipment Co., Mishawaka, Ind.; HARRY G. MOUAT, Martin Building, Birmingham, will represent the company in parts of the South Atlantic States; FRANK R. SMITH, P. O. Box 497, New Orleans, is to handle sales in some of the Gulf States; T. C. Ruhling & Co., Burt Building, Dallas, Tex., will handle sales in Texas, Oklahoma and part of Arkansas, and M. B. HEISNER, Denver, will represent the company in Colorado, Wyoming and New Mexico.

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ROBERT E. ALLEN, of Los Angeles, has resigned as assistant oil umpire of California to join the staff of the oil division of the A. O. Smith Corp., Milwaukee. He is a graduate of the University of West Virginia and has been identified with the oil industry in various phases for many years, including two years of exploration work in Australia.

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OLIVER C. HENKEL has been appointed district sales manager in the New York metropolitan area for the Empire Sheet & Tin Plate Co., Mansfield, Ohio. Mr. Henkel has been connected with the Empire company for the past five years, recently serving as sales promotion engineer and advertising manager. The Empire company has established its new New York sales office at 500 Fifth Avenue.

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GEORGE F. BAKER has resigned from the board of directors of the United States Steel Corp. of which he has been a member since 1922 and from the finance committee of which he has been a member since 1930. LEON FRASER, vice-president of the First National Bank was elected as director and member of the finance committee of the corporation to succeed Mr. Baker.

OBITUARY

WILLIAM F. BUTTERWORTH, former president of the Chamber of Commerce of the United States and chairman of Deere & Co., Moline, Ill., died of a heart attack at Absecon, N. J., on May 39, aged 71 years. He became identified with the company in 1892 as an assistant buyer. He became president of the company in 1907 and chairman in 1928.

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HAROLD C. RAWLINGS, production manager of the John Lauson Mfg. Co., New Holstein, Wis., manufacturer of tractors and gasoline engines, died at his home in Milwaukee on May 30, aged 41 years. He was graduated in engineering from the University of Illinois in 1916.

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LOUIS F. REINHARD, sales manager of the contract department of the Geuder, Paeschke & Frey Co., Milwaukee, manufacturer of metal stampings, died at his home in Milwaukee on June 2, aged 51 years. He was born in Milwaukee and was graduated from the college of engineering, University of Wisconsin, in 1907. Prior to his connection with the Geuder company in 1921, he was for many years identified with the motor sales department of the Louis Allis Co.

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GLEN E. GUY, district representative in Cleveland for the Baker Industrial Truck Co., Cleveland, died at his home on June 1, aged 58 years. He was graduated from Pennsylvania State College and was with the General Electric Co. for several years. In 1924 he became associated with the Baker company in the northern Ohio territory.

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LEONARD B. MILLER, long prominently identified with the Lake Superior iron ore industry, died in a Cleveland hospital June 2, aged 75 years. His home for a number of years had been in Mentor, a Cleveland suburb. Mr. Miller became a member of the firm of Oglebay, Norton & Co., Cleveland, in 1891, after having been previously affiliated with the ore industry for some time and was a member of that firm 30 years. With headquarters in Cleveland he had charge of the operation of the firm's mines and during the earlier years of his partnership in the firm devoted considerable attention to ore sales. After leaving Oglebay, Norton & Co. he was affiliated for some time with an independent iron ore mining company. His activities during the past few years have been rather limited because of poor health.

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ROBERT E. BELKNAP, associated most of his business life with the Bethlehem Steel Co., died June 4 at the Massachusetts Memorial Hospital. His first connection with the steel industry was with the Pennsylvania Steel Co., following which he became associated with the Bethlehem Steel Co. Prior to his resignation, July 1, 1929, Mr. Belknap was New England manager of that company. He was 61 years old.

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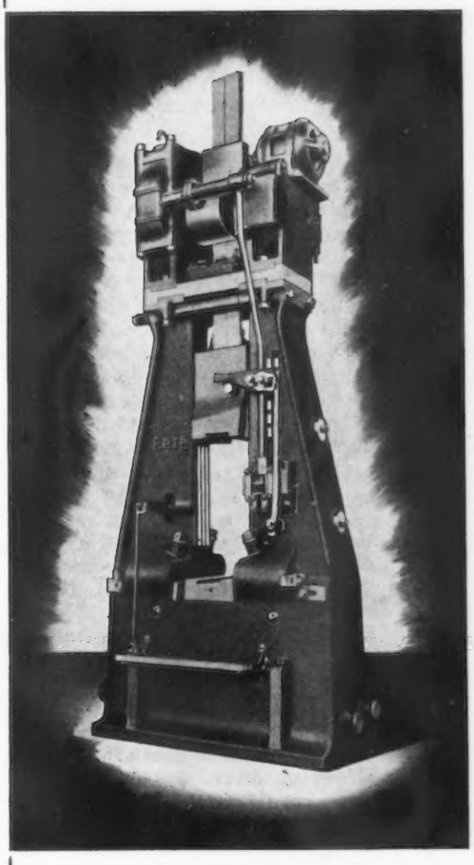
DUANE H. NEWTON, Eastern sales representative, Vanadium

The Idea Clicks



Customer acceptance of a new design is really endorsement by a Jury of Critical Experts. A search of the records shows that no hammer has ever "caught on" as quickly as the ERIE Type M. It was the design that the forge shops were waiting for to put production on a modern basis of efficiency and economy.

Is your shop on the way out, or are you keeping your equipment in a position to compete?

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Corp. of America, died after a brief illness on May 23, at Hartford.

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WILLIAM F. LLOYD died at his home at Sewickley, Pa., on May 27, aged 75 years. Mr. Lloyd had been identified with his father's steel business, Lloyd-Black Co., one of the first steel companies in the Pittsburgh district. He retired more than 30 years ago.

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JAMES FENTON MITCHELL, who in August would have been with the Colonial Steel Co. 50 years, died in Milton, Mass., May 27, aged 63 years.

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JOHN N. DERSCHUG, president of the Easy Washing Machine Corp., Syracuse, N. Y., died in that city on June 2.

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JOHN F. PRICE, executive vice-president, Trundle Engineering Co., Cleveland, who had devoted his attention for many years to problems of management, died on June 7 of a heart attack at the age of 74 years.

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WILLIAM B. N. HAWK, who before his retirement served for 35 years as chief chemist of the National Tube Co., Lorain, Ohio, died of a heart attack on June 5, aged 72 years.

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CHARLES A. IRWIN, who for about 30 years was associated with the sheet and tin plate industry in the Canton-Massillon district in Ohio, died in Canton June 2, aged 63 years. Mr. Irwin and a brother, W. W. Irwin, chairman of the board of the Superior Sheet Steel Co., Canton, went to that city in 1893 from their native town of Leechburg, Pa., and were employed in the plant then occupied by the Canton Rolling Mill Co. Later the two brothers built and operated a plant at Dennison, Ohio, and in 1900 returned to Canton where they took part in the organization of the Stark Rolling Mill Co., which is now a unit of the Republic Steel Corp. A little later Mr. Irwin and his brother founded the Canton Sheet Steel Co. of which he was general manager, secretary and treasurer. In 1921 Charles A. Irwin became president of the Milwaukee Rolling Mill Co., Milwaukee, operating a sheet mill which in 1924 was sold to the Inland Steel Co. of Wisconsin, subsidiary of the Inland Steel Co. He retired about 10 years ago on account of his health.

CYRUS H. McCORMICK, retired chairman of the board of directors of the International Harvester Co., whose death was noted in these columns last week.

WILLIAM P. GLEASON, who until his retirement in 1935 was general manager of the Gary works of the Illinois Steel Co., died at his home in Chicago on June 14, aged 71 years. He was a native of Chicago and went to work for the Illinois company in 1880. Seven years later he was made foreman of the machine shop, and from 1892 to 1900 he was master mechanic at the Joliet works. For the next five years he was assistant manager at the Clairton works of the Carnegie Steel Co. In 1906 he was chosen general superintendent in charge of construction of the Gary works, of which he became general manager in 1908. Mr. Gleason was a director of the Indiana Steel Co. and of the Universal-Atlas Cement Co.

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JOHN BRUNNER, special consultant for the Carnegie-Illinois Steel Corp. at Chicago, died after a long illness on June 15. He was born in Sweden in 1866 and was graduated from the Royal Institute of Technology of Sweden in 1887. He came to this country the following year and for the next eight years worked in the engineering department of the Boston & Maine Railway, the Mount Vernon Bridge Co., and the Carnegie Steel Co. He was bridge engineer and later chief engineer for the city of Pittsburgh from 1896 to 1902. He entered the employ of the Illinois Steel Co. as assistant general superintendent of the North works in 1902, and was assistant inspecting engineer from 1912 to 1923, when he was made manager of the metallurgical and inspection department.

J. & L. Penalized for Contesting Labor Act

WASHINGTON, June 16—Angered because it had contested the Wagner labor act, Secretary of Interior Harold I. Ickes today withheld a contract for 1,438,560 lb. of sheet piling for Imperial Dam, a PWA project, which had been placed with the Jones & Laughlin Steel Corp., Pittsburgh.

Mr. Ickes' action was the outgrowth of a decision handed down yesterday by the United States Circuit Court of Appeals at New Orleans, which upheld Jones & Laughlin in contending that the Wagner Labor Disputes Act is unconstitutional. The National Labor Relations Board had asked the court to enforce a board order asking the company to reinstate union workers at the company's Aliquippa, Pa., plant. The board charged the employes were discharged because they were union workers.

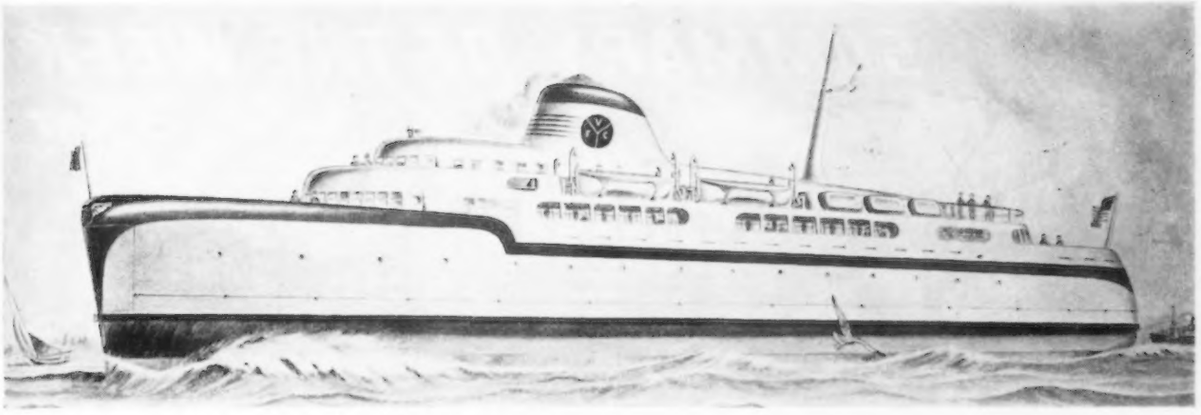
The proposed sheet piling order involved $40,086.91. The piling was to be used in the construction of the All-American Canal on the Colorado River near Yuma, Ariz.

Of the four bids received, that of the Bethlehem Steel Co. was disqualified because of a discrepancy, Mr. Ickes said. The Inland Steel Co., Chicago, which has a plant at Indiana Harbor, Ind., and the Carnegie-Illinois Steel Corp. were the other two bidders. Their bids now are being studied prior to a decision on future action.

"In the case of deciding between identical bids," Secretary Ickes said, "I shall always prefer that of the bidder which is fair to its workers. I disapprove of the practice of identical bidding, and would reject all such bids except for the fact that to reject them would carry no assurance of getting anything but more identical bids after readvertisement and delay.

"I am glad to take advantage of a case of identical bidding to throw additional weight behind the Government's effort to obtain and enforce fair treatment of labor. It has always been the policy of work-giving agencies under my direction to see that labor gets a square deal.

Mr. Ickes said that the contract was to have been awarded to Jones & Laughlin because its plant was the farthest removed from the Imperial Dam site of those who presented qualified bids, when the National Labor Relations Board notified him of the board's decision against Jones & Laughlin.



Sun Shipbuilding Completes Streamlined Steel Automobile Ferry for Bay Service

A COMPLETELY streamlined automobile and passenger ferry for service between Cape Charles, Md., and Little Creek Harbor, Va., is being completed in the yards of the Sun Shipbuilding & Dry Dock Co., Chester, Pa., for the Virginia Ferry Corp. The unique vessel, which is of the twin-screw type with twin rudders, has an overall length of 260 ft., a breadth of 59 ft. and a depth of 19 ft. 1 in. As pictured below, the ship is built entirely on modern streamline principles, including the entire superstructure, the smokestack and the mast.

It is constructed entirely of steel and will accommodate about 60 automobiles and trucks on the main deck, the gangway arrangement on the main deck being such as to permit the loading and unloading over the bow and stern. The promenade deck is arranged to carry passengers, the forward portion being for white and the after portion for colored passengers, all of which have suitable washroom and toilet facilities.

The officers' accommodation is situated in the streamlined deckhouse at the forward end of the boat deck. Galley and messrooms, also accommodation for crew is forward. Commodius quarters for white and colored truck drivers are arranged aft. Dining and lunch rooms are located inside the promenade deckhouse. The main dining room is enclosed in steel coamings with the upper part of glass, similar to the promenade deckhouse, enabling passengers to have an unobstructed view while dining.

This vessel is built of fireproof construction throughout, all divisional bulkheads and doors in quarters being of metal. It is designed to maintain a speed of 18 m.p.h.

The propelling machinery, built by Skinner Engine Co., Erie, Pa., consists of two four-cylinder Unaflow engines 19-in. bore by 20-in. stroke operating at 275 lb. steam pressure. Steam is supplied by two Foster-Wheeler Watertube Boilers of 3800 sq. ft. heating surface equipped with interdeck superheaters and arranged for burning oil under induced draft. A complete CO_2 fire extinguishing system is fitted in the boiler room.

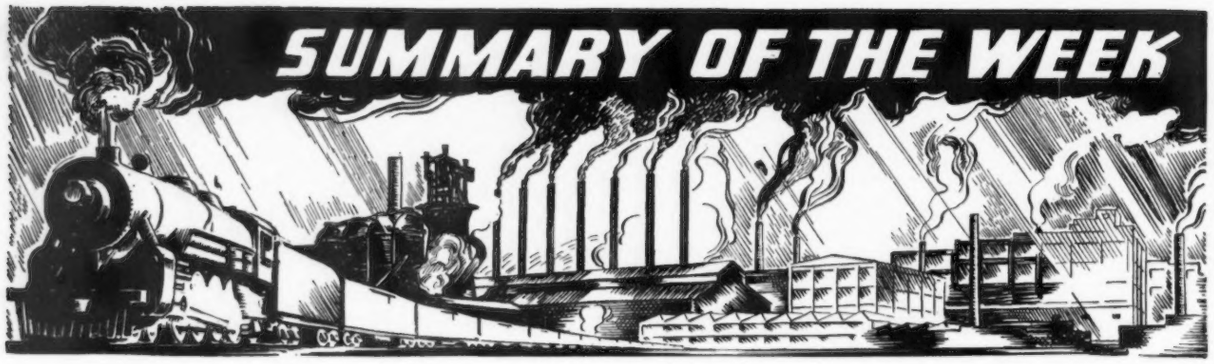
Heating and ventilating throughout is accomplished by motor driven fans giving positive circulation of fresh air throughout the vessel. A complete change of air will occur every 5 min. in quarters and every minute in galley and lunch counter. The heating is accomplished by four steamheated Carrier Brunswick "Aerofin" heaters.

The steam steering engine is a Lidgerwood special 5 x 6-in. drum type steering gear, connected to quadrant by wire rope for twin rudders with polished brass column in pilot house, together with a hand steerer of the quadrant rack and pinion type.

Combined capstan and windlass on port side forward is driven from below deck by an electric motor with extended shafts which in turn also operate the capstan on the starboard side forward.

Mooring capstans on the port and starboard sides aft are driven from below deck by a single motor with extended shafts, duplicate of the drive for the forward combination.

The fourth annual industrial materials exhibit will be held Oct. 5 to 10, at the Hotel Roosevelt, New York. This is a cooperative exhibit and sponsored independently by a group of industrial materials manufacturers. Several interesting new features are in process of development for this show and will be announced at a later date. F. D. Bowman, advertising manager, Carborundum Co., Niagara Falls, N. Y., has been appointed chairman of the exhibit committee.



. . . Mills are embarrassed by continued heavy buying at second quarter prices.

° ° °

. . . Tonnage already placed will occupy producers well into third quarter.

° ° °

. . . Ingot production rises to new six-year high of 71 per cent.

STEEL MAKERS are currently more concerned with the problem of how much tonnage they should take at prevailing quotations than with the usual search for more business. Enough orders have already been booked to fill rolling schedules for the remainder of June and flat-rolled capacity is taken care of well into July.

When price increases were announced late last month, it was intended that tonnage taken at current quotations should be shipped by the end of the quarter. This would have made the higher figures effective on July 1. The present situation indicates that while the new prices will be applied to new orders placed after that date, little buying will be necessary until some time in August and mills will be occupied during the interim with releases against old low-priced orders.

THE rush to cover at old prices is taxing active ingot capacity to the utmost, and production is up another point this week to 71 per cent of capacity. This is the highest level in more than six years and is a full 10 points above the peak reached when prices were last advanced in June, 1934. Higher operations are reported this week at Pittsburgh, Philadelphia, Youngstown, Buffalo, Wheeling and St. Louis.

Finishing mill schedules are still led by the tin plate division, where output is currently exceeding theoretical capacity. Rail mills are slowing down, with the Birmingham unit scheduled to close at the end of the week. In other departments operations are either maintained or slightly heavier.

PRICE increases have brought life to the railroad market. Advances of $2 a ton on tie plates and $3 on track spikes and bolts will become effective Aug. 1, but the carriers will be given until Sept. 30 to take shipments of material ordered at the old figures. Rails are scheduled to be marked up for fourth quarter delivery.

Merchant's Despatch, Inc., has placed 500 refrigerator cars with its own shops. Wheeling & Lake Erie is in the market for 250 to 1000 hopper cars, the Chicago, Burlington & Quincy will buy 250 hopper, 500 box cars and three locomotives, the Chicago Great Western is inquiring for 100 flats, and a large eastern car builder is considering the purchase of 2000 tank cars for leasing. The New York Central will take bids June 26 on its undetermined second half rail and accessory requirements and an unnamed carrier has bought 3200 tons of rails.

BUYERS of construction steel for identified projects are now being given only 30 days after bids are taken in which to place their orders. Under the code a 60-day interval was allowed, but as heretofore specifications may be placed over the life of the job. This factor is accelerating demand for plates, shapes and reinforcing bars.

The week's fabricated structural steel awards amount to 25,400 tons, compared with 15,800 tons in the previous period, but new projects have decreased from 23,300 tons to 18,450 tons. Total awards of construction steel reported to THE IRON AGE this year have amounted to 800,060 tons, compared with 588,455 tons in the corresponding 1935 period, an increase of 36 per cent.

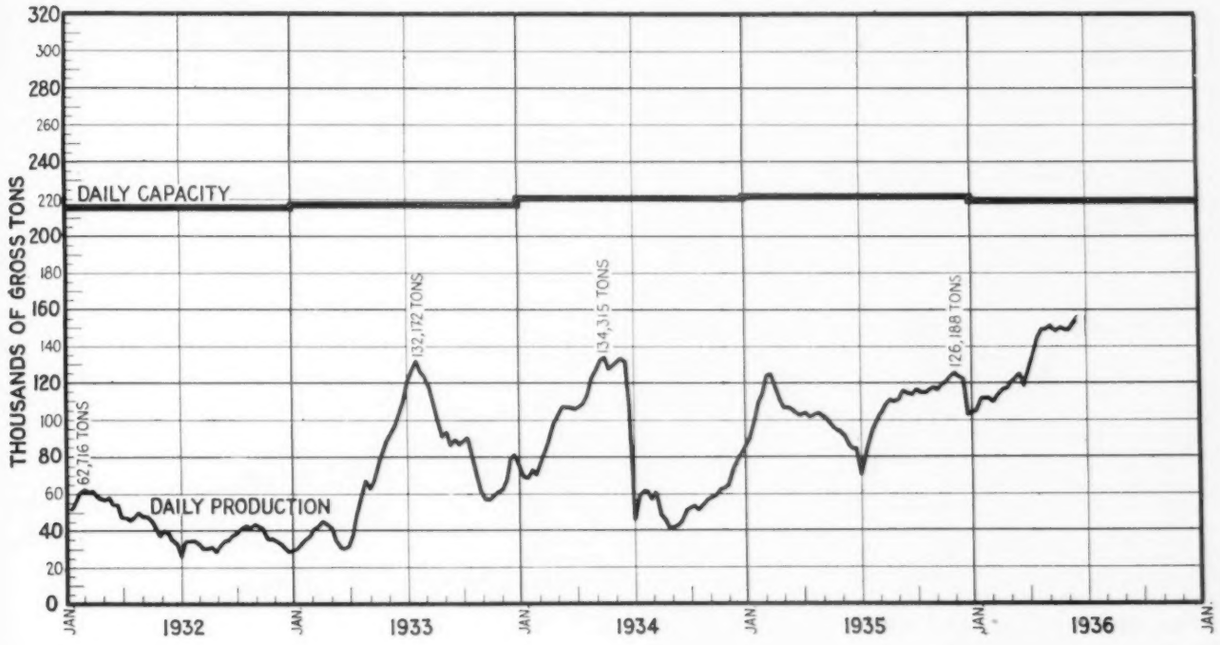
STEEL companies will benefit materially by a decision of the Interstate Commerce Commission reducing emergency freight surcharges on pig iron from a maximum of 44.8c. a gross ton to 25c.; on iron ore from 10c. to 8c. a net ton, and on coal and coke from 15c. a ton to 10c. The commission also denied the application of the carriers that the surcharges be made permanent and extended them only to Dec. 31, 1936.

THE raw material markets are featured by continued heavy contracting for pig iron and a strong tone in scrap. THE IRON AGE scrap composite has moved up 8c. a gross ton to $12.75, after an eight-week decline. The pig iron composite is unchanged at $18.84 a gross ton. In the absence of sales of finished steel at third quarter prices, the finished steel composite remains at 2.097c. a lb.

STEEL INGOT PRODUCTION

Daily Tonnage of Bessemer and Open-Hearth Steel Ingots Produced by Weeks, 1932-1936

Current Week	Last Week	Weeks Ended June 22, 1935	June 23, 1934	June 24, 1933	June 25, 1932
155,826	153,631	84,125	132,113	104,004	34,602



STEEL INGOT PRODUCTION BY DISTRICTS: Per Cent of Capacity

District	Current Week	Last Week	Weeks Ended May 23, 1936	June 22, 1935	June 23, 1934
Pittsburgh	67.0	66.0	63.0	34.0	54.0
Chicago	71.0	71.0	67.0	39.5	65.0
Valleys	75.0	71.0	74.0	42.0	62.0
Philadelphia	46.0	43.0	45.0	31.0	47.0
Cleveland	76.0	76.0	74.0	41.0	63.0
Buffalo	85.0	80.0	73.0	32.0	61.0
Wheeling	96.0	95.0	90.0	45.0	78.0
Southern	67.0	67.0	67.0	25.0	63.0
Ohio River	63.5	80.5	80.0	55.0	60.0
Western	80.0	80.0	80.0	30.0	35.0
St. Louis	90.0	85.5	77.5	22.0	40.0
Detroit	100.0	100.0	100.0	95.0	100.0
Eastern	90.0	85.0	85.0	35.0	55.0
Aggregate	71.0	70.0	68.5	38.0	60.0
Average Year to Date	60.3	59.9	58.6	46.8	48.3

Weekly Booking of Construction Steel

From The Iron Age

	Week Ended June 16, 1936	June 9, 1936	May 19, 1936	June 18, 1935	Year to Date 1936	1935
Fabricated structural steel awards	25,410	15,800	34,720	25,200	489,280	362,795
Fabricated plate awards	2,965	9,470	1,940	3,610	126,395	83,260
Steel sheet piling awards	625	790	1,275	0	18,390	23,945
Reinforcing bar awards	1,140	4,265	4,800	3,150	165,995	118,455
Total Lettings of Construction Steel	30,140	30,325	42,735	31,960	800,060	588,455

. . . Heavy finished steel demand continues, with flat-rolled products in lead.

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. . . Ingot output is pushed up one point at both Pittsburgh and Wheeling.

o o o

. . . Scrap market shows firmer tendency.

PITTSBURGH, June 16.—A continuation of demand for immediate consumption and an increase in forward buying have moved steel operations in the Pittsburgh district up fractionally to 67 per cent of capacity, while the Wheeling district is one point higher at 96 per cent. Most of the forward buying is taking place in strips, sheets and cold-finished material, and to some degree in hot-rolled bars.

Increases for fourth quarter delivery of $2 on tie plates and $3 on railroad spikes and track bolts have been announced. Customers may specify at present prices until August for shipment through September.

Since there will be no price increases for third quarter delivery on wire and tubes, demand for these products remains at recent levels. There is a fairly heavy movement of semi-finished material to non-integrated mills, who obviously are taking advantage of present quotations.

The recent improvement for immediate consumption in hot-rolled bars persists. Coupled with demands from non-integrated makers of cold-finished, in addition to those other consumers who are anticipating their needs, both sales and shipments are increasing daily. During the past week the cold-finished market has been actively stimulated, due in a large measure to anticipatory buying on the part of warehouses, implement makers and machinery makers. There is a noticeable absence of any forward buying on the part of automobile people, except those parts makers who are able to anticipate their needs to some extent for 1937 models.

Movement of plates and shapes continues strong. Of local interest is the formal awarding of the balance of the material to be used for the Jones & Laughlin Steel Corp. strip mill buildings. Approximately 9800 tons has been allocated among the company's own fabricating plant and local shops. A previous award of 5000 tons was made some time ago. The increase in the number of private projects appearing over the past two weeks continues and is an optimistic note in the heavy materials picture. Wire products, especially merchant wire, which have been in the doldrums for some time, have shown signs of life following better specifying on the part of warehouse people.

Tin plate operations are still at capacity, with no immediate evidence of a let-down. Shipments are ahead of production. Both strip and sheet specifications are better, due in a large measure to forward buying. This tendency is expected to continue during the balance of the month.

Coal movement from this district to the Lakes is expected to improve materially due to the reduction of 5c. a ton in the emergency freight rates. The scrap market is showing signs of strength. There is a satisfactory movement of refractories materials.

Pig Iron

Shipments continue in carload lots, with total tonnages involved equal to or greater than last month. While large buyers remain on a hand-to-mouth basis, several of them have asked for contracts, unsolicited, feeling that there might be a possibility of an increase in prices, due to heavier costs and the fact that steel products generally have been increased for the third quarter. Sanitary ware manufacturers are taking iron in fair quantities and the same may be said of steel foundries.

Semi-Finished Steel

Demand for semi-finished material is up sharply this week, due in a large measure to forward buying by non-integrated mills. There is a good movement of sheets, bars and rerolling billets. However, coupled with this anticipatory buying are substantial tonnages for immediate consumption. The trend over the next few weeks will be upward in the matter of specifications and shipments.

Bolts, Nuts and Rivets

Demand in this market persists at a fairly active rate, with a large amount of bookings being placed by railroad car builders and a goodly amount from carriers who are busily engaged in repair work at their car shops. Meanwhile miscellaneous sources continue to specify fairly freely. As yet there is slight evidence of forward buying due to higher prices in the third quarter.

Rails and Track Accessories

Announcement has been made that railroad tie plates will be advanced $2, and track spikes $3 a ton for fourth quarter delivery. The new prices will be effective Aug. 1, with shipments against specifications to be made until Sept. 30. It is not expected that the present quotation on heavy rails for third quarter delivery will be changed. However, it is the opinion that an increase will be in order for fourth quarter delivery.

Bars

A sharp increase in demand is in evidence this week. Some part of it can be attributed to forward buying. However, such buying is for known requirements. So far there has been little indication of purely speculative purchases. Meanwhile heavy demand for immediate consumption continues. The releases are widely diversified, with fairly good tonnages going to non-integrated makers of cold finished steel. While quite a few consumers are undoubtedly taking advantage of present prices, it is not expected that this tendency will assume great proportions since the savings would be offset

A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous: Advances Over Past Week in Heavy Type, Declines in Italics

Rails and Semi-finished Steel

Per Gross Ton:	June 16, 1936	June 9, 1936	May 19, 1936	June 18, 1935
Rails, heavy at mill	$36.37½	$36.37½	$36.37½	$36.37½
Light rails, Pittsburgh	35.00	35.00	35.00	35.00
Rerolling billets, Pittsburgh	28.00	28.00	28.00	27.00
Sheet bars, Pittsburgh	28.00	28.00	28.00	28.00
Slabs, Pittsburgh	28.00	28.00	28.00	27.00
Forging billets, Pittsburgh	35.00	35.00	35.00	32.00
Wire rods, Nos. 4 and 5, P'gh	38.00	38.00	38.00	38.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.80	1.80	1.80	1.70

Finished Steel

Per Lb.:	Cents	Cents	Cents	Cents
Bars, Pittsburgh	1.85	1.85	1.85	1.80
Bars, Chicago	1.90	1.90	1.90	1.85
Bars, Cleveland	1.90	1.90	1.90	1.85
Bars, New York	2.20	2.20	2.20	2.15
Plates, Pittsburgh	1.80	1.80	1.80	1.80
Plates, Chicago	1.85	1.85	1.85	1.85
Plates, New York	2.09	2.09	2.09	2.09
Structural shapes, Pittsburgh	1.80	1.80	1.80	1.80
Structural shapes, Chicago	1.85	1.85	1.85	1.85
Structural shapes, New York	2.06¼	2.06¼	2.06¼	2.06¼
Cold-finished bars, Pittsburgh	2.10	2.10	2.10	1.95
Hot-rolled strips, Pittsburgh	1.85	1.85	1.85	1.85
Cold-rolled strips, Pittsburgh	2.60	2.60	2.60	2.60
Hot-rolled annealed sheets, No. 24, Pittsburgh	2.40	2.40	2.40	2.40
Hot-rolled annealed sheets, No. 24, Gary	2.50	2.50	2.50	2.50
Sheets, galv., No. 24, P'gh	3.10	3.10	3.10	3.10
Sheets, galv., No. 24, Gary	3.20	3.20	3.20	3.20
Hot-rolled sheets, No. 10, P'gh	1.85	1.85	1.85	1.85
Hot-rolled sheets, No. 10, Gary	1.95	1.95	1.95	1.95
Cold-rolled sheets, No. 20, Pittsburgh	2.95	2.95	2.95	2.95
Cold-rolled sheets, No. 20, Gary	3.05	3.05	3.05	3.05
Wire nails, Pittsburgh	2.10	2.10	2.10	2.60
Wire nails, Chicago dist. mill	2.15	2.15	2.15	2.65
Plain wire, Pittsburgh	2.40	2.40	2.40	2.30
Plain wire, Chicago dist. mill	2.45	2.45	2.45	2.35
Barbed wire, galv., Pittsburgh	2.60	2.60	2.60	3.00
Barbed wire, galv., Chicago dist. mill	2.65	2.65	2.65	3.05
Tin plate, 100 lb. box, P'gh	$5.25	$5.25	$5.25	$5.25

On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

Pig Iron

Per Gross Ton:	June 16, 1936	June 9, 1936	May 19, 1936	June 18, 1935
No. 2 fdy., Philadelphia	$21.3132	$21.3132	$21.3132	$20.3132
No. 2, Valley furnace	19.50	19.50	19.50	18.50
No. 2, Southern Cin'ti	20.2007	20.2007	20.2007	19.2007
No. 2, Birmingham†	15.50	15.50	15.50	14.50
No. 2, foundry, Chicago*	19.50	19.50	19.50	18.50
Basic, del'd eastern Pa.	20.8132	20.8132	20.8132	19.8132
Basic, Valley furnace	19.00	19.00	19.00	18.00
Malleable, Chicago*	19.50	19.50	19.50	18.50
Malleable, Valley	19.50	19.50	19.50	18.50
L. S. charcoal, Chicago	25.2528	25.2528	25.2528	24.2528
Ferromanganese, seab'd carlots	75.00	75.00	75.00	85.00

†This quotation is for delivery in South; in the North prices are 38c. a ton under delivery quotations from nearest Northern furnace.

*The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Scrap

Per Gross Ton:				
Heavy melting steel, P'gh	$13.50	$13.25	$14.25	$11.75
Heavy melting steel, Phila.	12.00	12.00	12.75	10.50
Heavy melting steel, Ch'go	12.75	12.75	12.75	9.87½
Carwheels, Chicago	13.50	13.50	13.50	10.50
Carwheels, Philadelphia	13.75	13.75	13.75	11.25
No. 1 cast, Pittsburgh	14.75	14.75	15.25	13.25
No. 1 cast, Philadelphia	14.00	14.00	14.00	11.25
No. 1 cast, Ch'go (net ton)	12.00	12.00	12.00	9.00
No. 1 RR. wrot., Phila.	14.75	14.75	14.75	10.25
No. 1 RR. wrot., Ch'go (net)	11.50	11.50	11.50	7.75

Coke, Connellsville

Per Net Ton at Oven:				
Furnace coke, prompt	$3.65	$3.65	$3.65	$3.50
Foundry coke, prompt	4.25	4.25	4.25	4.00

Metals

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Electrolytic copper, Conn.	9.50	9.50	9.50	8.75
Lake copper, New York	9.62½	9.62½	3.62½	9.12½
Tin (Straits), New York	41.62½	42.50	45.90	51.00
Zinc, East St. Louis	4.90	4.90	4.90	4.30
Zinc, New York	5.27½	5.27½	5.27½	4.67½
Lead, St. Louis	4.45	4.45	4.45	3.85
Lead, New York	4.60	4.60	4.60	4.00
Antimony (Asiatic), N. Y.	13.00	13.50	13.50	12.75

The Iron Age Composite Prices

	Finished Steel	Pig Iron	Steel Scrap
June 16, 1936	2.097c. a Lb.	$18.84 a Gross Ton	$12.75 a Gross Ton
One week ago	2.097c.	18.84	12.67
One month ago	2.097c.	18.84	13.25
One year ago	2.124c.	17.84	10.71
	Based on steel bars, beams, tank plates, wire rails, black pipe, sheets and hot-rolled strips. These products represent 85 per cent of the United States output.	Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.	Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	Finished Steel		Pig Iron		Steel Scrap	
	HIGH	LOW	HIGH	LOW	HIGH	LOW
1936	2.130c., Jan. 7;	2.084c., Mar. 10	$18.84, Jan. 7;	$18.84, Jan. 7	$14.75, Feb. 25;	$12.67, June 9
1935	2.130c., Oct. 1;	2.124c., Jan. 8	18.84, Nov. 5;	17.83, May 14	13.42, Dec. 10;	10.33, April 23
1934	2.199c., April 24;	2.008c., Jan. 2	17.90, May 1;	16.90, Jan. 27	13.00, Mar. 13;	9.50, Sept. 25
1933	2.015c., Oct. 3;	1.867c., April 18	16.90, Dec. 5;	13.56, Jan. 3	12.25, Aug. 8;	6.75, Jan. 3
1932	1.977c., Oct. 4;	1.926c., Feb. 2	14.81, Jan. 5;	13.56, Dec. 6	8.50, Jan. 12;	6.43, July 5
1931	2.037c., Jan. 13;	1.945c., Dec. 29	15.90, Jan. 6;	14.79, Dec. 15	11.33, Jan. 6;	8.50, Dec. 29
1930	2.273c., Jan. 7;	2.018c., Dec. 9	18.21, Jan. 7;	15.90, Dec. 16	15.00, Feb. 18;	11.25, Dec. 9
1929	2.317c., April 2;	2.273c., Oct. 29	18.71, May 14;	18.21, Dec. 17	17.58, Jan. 29;	14.08, Dec. 3
1928	2.286c., Dec. 11;	2.217c., July 17	18.59, Nov. 27;	17.04, July 24	16.50, Dec. 31;	13.08, July 2
1927	2.402c., Jan. 4;	2.212c., Nov. 1	19.71, Jan. 4;	17.54, Nov. 1	15.25, Jan. 11;	13.08, Nov. 22

by the cost of storage facilities and rehandling.

Steel Sheet Piling

Jones & Laughlin Steel Corp. has been awarded a contract for 126 tons of steel sheet piling to be used as a bulkhead at Anglesea, N. J., for the United States Coast Guard. Bids are in but the award has not yet been made on 1236 tons of piling for a bulkhead at the Cape Cod Canal, Sandwich, Mass. This project is under the supervision of the United States Engineer Office. Desilting Works, Loup River Public Power District, Columbus, Neb., has received bids on 628 tons of piling to be made into a cut-off wall. The Bureau of Reclamation, Denver, has asked for bids on three jobs for the All-American Canal, comprising approximately 176 tons each. Lock and dam No. 24, Mississippi River, Clarksville, Mo., will take a large amount of piling to be used as a cofferdam.

Cold-Finished Bars

A sharp increase in demand for cold-finished material over the past week is traced to forward buying on the part of many consumers. Warehouses are specifying heavily, as are makers of textile machinery, implement producers, and automobile parts makers who are able to estimate their requirements for 1937 models. Shipments this week, however, are comprised largely of tonnages going into immediate consumption. Coupled with the specifications comprising anticipatory buying are bookings for material to be shipped immediately. As a result, mills will have a heavy backlog, with a high operation during the balance of this month and part of July.

Reinforcing Steel

Mills continue to be pushed for shipments on specific jobs, with the probability of this high activity extending well into July. While new jobs have not been plentiful, several are in the offing and may materialize shortly.

Plates and Shapes

Specifications for plates and shapes during the past week have been equally as good as the week before, and the tendency is for improvement in the future, since it is expected that buyers will cover for specific projects at present prices. Further improvement in the number of private projects was again shown this week in the structural awards. Over half the contracts called for material going into either new buildings or additions to present buildings of manufacturing concerns. Jones & Laughlin Steel Corp. has let contracts for 9800 tons, making the final allotment on its sheet-strip mill buildings. The award was divided between the Fort Pitt Bridge Works Co., the Keystone works of the Jones & Laughlin company, and the Levinson Co., another local fabricator.

Tubular Products

Demand continues at recent levels. Satisfactory tonnages are being placed for both industrial and railroad boiler tubes. Production is at a good rate in this district, resulting in some measure from awarding to the local concerns of recent line pipe orders.

Wire Products

Over the past week the temporary lull in merchant wire business has been alleviated to some extent through increased specifications from jobbers. The latter have experienced a better movement of goods lately than was anticipated, and as a result are replenishing some of their stocks. Meanwhile specifications and movement of manufacturers' wire continues without any outstanding change.

Sheets

Sheet specifications have improved slightly this week, and production has picked up a few points to 62 to 63 per cent of capacity. Anticipatory buying has made its appearance to a greater degree than last week, and is expected to increase during the balance of the month. Meanwhile, demand for immediate consumption continues at a good rate. Car roof builders are taking fair tonnages, as are drum manufacturers and other miscellaneous sources.

Tin Plate

Tin plate production is a shade above 100 per cent of theoretical capacity. The heavy influx of specifications from general line can makers continues to swell the total tonnages already increased by daily requirements being placed by can makers. The peak of production for milk can makers is approaching, the season having been a little later than usual this year.

Strip Steel

Both demand and shipments have improved this week, while some of the increase can be attributable to some forward buying. Implement makers are taking good tonnages, and during the past week a fair-sized tonnage has been placed for highway guards. Some automobile parts makers are specifying quite freely, with indications that some of the material is for 1937 models. There have also been some healthy bookings from sewing machine people. There are no signs as yet of any anticipatory buying on the part of automobile manufacturers, nor is such purchasing expected in any large degree.

Coal and Coke

Movement of industrial coke continues at recent levels, with no outstanding developments during the past few weeks. Movement of coal from this district to the Lakes has shown no improvement over the previous week. However, since the Interstate Commerce Commission has reduced the emergency freight rates from 15c. to 10c. per ton on coal to the Lakes, it is expected that a far greater movement will now result.

RAILROAD EQUIPMENT

Boston & Maine and Portland Terminal Co. have each purchased three 600-hp. diesel switching engines from American Locomotive Co. and Electro Motive Corp.

Wheeling & Lake Erie is inquiring for 250 to 1000 hopper cars.

Chicago, Burlington & Quincy has obtained permission to buy three type 4-8-4 steam locomotives, 250 55-ton hopper cars, and 500 50-ton single-sheathed box cars. Streamlined trains will be purchased from independent builders, while remaining equipment will be constructed in the company shops.

Chicago Great Western is inquiring for 100 50-ton flat cars.

International Railways of Central America are inquiring for 150 to 300 12-ton banana cars.

Cornwall Railroad has ordered 20 70-ton ore cars from Bethlehem Steel Co.

Merchants Despatch, Inc., New York, has placed 500 refrigerator cars with Merchants Despatch Transportation Co., East Rochester, N. Y.

Montreal Tramways Co. has purchased from American Car & Foundry Motors Co. five 30-passenger buses, powered with Hall-Scott horizontal engines.

Bethlehem Steel Co. has begun work at Wilmington, Del., plant on 60 two-car articulated light-weight trains for Railway Equipment & Realty Co., San Francisco, for operation over San Francisco-Oakland Bay Bridge. Trains are to be built of Mayari R, a high-tensile, corrosion-resisting steel.

RAILS AND TRACK SUPPLIES

New York Central will take Clayton Act bids June 26 on its second half requirements of rails, tie plates, splice bars, track bolts and track spikes. Material is to be shipped by Sept. 30, but tonnage has not yet been determined.

A Mid-Western carrier has purchased 3200 tons of rails.

. . . Mills are filling July books with tonnage at current prices.

o o o

. . . Steel production holds at 71 per cent of capacity.

o o o

. . . Third quarter pig iron contracting is at high rate.

CHICAGO, June 16.—Sales of finished steel continue heavy and there is considerable misgiving in the trade as to when shipments against second quarter prices can be cut off. Many mill units are already scheduled to the end of July and in such cases producers are attempting to select business or are actually closing books. The point is that second quarter prices could be withdrawn at any time now and the trade would be less jittery.

Ingot production remains steady at 71 per cent of capacity and promises to hold that rate for some time to come. Automobile plants are again buying to meet unexpected retail sales and contract car shops as well as railroad shops are increasing acceptances. This railroad business is being strongly reflected in malleable and steel foundries, the latter now experiencing the most rapid expansion in production of the last five or six years.

A producer of welded well casing finds business growing in that line and in general oil and gas country steel needs are expanding. Droughts in many sections of the country are beginning to throw some doubt on business in those areas, though as yet such indicators as purchases of farm equipment and the distribution of wire and sheet products hold at high levels for June.

Scrap prices that had here and there been showing a few slight signs of strength have again leveled off on unfavorable market reports from the East.

Pig Iron

Third quarter books are growing three times faster than was the case when books were opened for the second quarter. Shipments are still running ahead of the June rate, the backing coming from railroad equipment shops, additional buying for current automobile models and steady use by the miscellaneous trade, including the machinery line. Furnace stocks of charcoal iron are very low and demand remains good.

Reinforcing Bars

There is much disappointment that highway work in Illinois does not progress more rapidly. Wisconsin is placing tonnages from time to time, and Indiana has been active, but is now temporarily slowing down while awaiting additional Federal funds. Fortunately, new large tonnages, some of which are for private work, are making their appearance. Up to this point shops have been very busy, but now a few larger orders are needed to bolster backlogs. About six of the mill jobbers in this area have published prices, with no changes from recently quoted levels.

Cast Iron Pipe

A few large jobs continue to give life to the market over and above the clean-up work that is being done on old and new WPA projects. Glamorgan Pipe & Foundry Co. has been awarded 1000 tons by Chicago for quick delivery. The remainder of the Chicago tonnage will probably be placed this month. Milwaukee has ordered 1000 tons and word is being passed around that the contractor who has the Cicero, Ill., job is near the closing point.

Plates

General business is holding all ground gained in recent weeks and in some directions there is decided improvement in demand for plate mill products. Leading the procession is new use in railroad equipment. Shipments are still going forward against the Illinois Central's repair program and within 60 days the Milwaukee Road will start to build 1500 cars in its Milwaukee shops. The Santa Fe may take figures on 300 cars, and specifications from contract car shops are growing. Mills are looking for releases against the Chesapeake & Ohio cars within the next few weeks. In addition to the above is the new life given by the Missis-

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sippi River deep waterway, specifications now being out for two dams and one set of locks. Tank business is steady but promises to expand on the basis of large inquiries that are developing in the Southwest.

Rails

A railroad running east from Chicago has made its first 1936 purchase, the amount being 3200 tons. Secondary purchases are a very live subject, though actual commitments are confined to a few odd lots which aggregate barely 1000 tons. Immediate needs of track supplies are well taken care of and new orders are light, but mills feel that this situation will not prevail long and that by mid-July orders will again become freer for maintenance needs through the late summer and early fall. Mills are retaining fair schedules and there is no danger of cessation of rolling until well into August.

Structural Steel

About 3100 tons of steel will be required for the Mississippi River dam at Quincy, Ill. Inquiry for this structure closely follows requests for prices for another dam and locks on the same stream. Price protection is being taken on a wide range of projects and some slow jobs are being driven in as a result of the price changes. Specifications reaching mills are improved over a week ago and the outlook is for still further gains. State highway bridge and overcrossing work is prominent in most of the states in the Mississippi Valley.

Bars

Mill units making bar products are faring exceptionally well in the rush to take advantage of second quarter prices. In fact, the matter of rolling schedules is becoming serious in view of deliveries and some units have closed books on certain classifications. The speculative angle is indicated by the fact that third quarter books are still light and users have little urge to make commitments at the higher prices. Releases by the automobile trade are slightly heavier and it now appears that farm implement manufacturers may be forced to smooth out production and register practically no dip in August. A farm truck manufacturer is behind on orders for all sizes and tractor units are still scrambling to meet demand. Improvements in tractor design and appointments are now playing an extremely important part in this market. From all outward appearances it seems that tractor buying is following the "two cars per family" idea of the automobile industry.

Wire Products

Incoming business is surprisingly good and the bulk of it is for current shipment and not on the contract basis. So far, the June drop is far below expectations and support from manufacturers appears to be such that a high rate of output will be sustained throughout the month. Distribution in country areas is also good for June, though some sections of the country, notably the Southeast, are handicapped by drought conditions. Producers are diverting some tonnage to stocks which were left ragged by the heavy spring demand. Mill stocks now have been evened up, but they have not been expanded to any great proportions.

Sheets

Automobile buying is further expanding mill books which, on the delivery basis, now extend to the end of July. The character of specifications shows that these tonnages are for extension of 1936 model programs, though one automobile builder is taking some steel on speculation. The general manufacturing lines are busily engaged and a high rate of consumption seems assured through July.

. . . Awards of 1140 tons —7235 tons in new projects.

AWARDS

Sharon, Mass., 130 tons, grade crossing, to an unnamed bidder.

State of Wisconsin, 350 tons, highway work, to Concrete Steel Co.

Chicago, 360 tons, Outer Drive, to Concrete Steel Co.

Pullman, Wash., 300 tons, women's dormitory at Washington State College, to Columbia Steel Co.

NEW REINFORCING BAR PROJECTS

Andover, Conn., 100 tons, overpass.

Buffalo, 100 tons, Buffalo sewer job; bids June 23.

Buffalo, 100 tons or more, sewer job; bids June 26.

Washington, 800 tons, warehouse for Hecht Co.; bids June 19.

State of North Carolina, 150 tons, highway bridges; bids June 18.

Cleveland, 200 tons, extension to Westerly sewage disposal plant.

Quincy, Ill., 1800 tons, dam across Mississippi River.

River Forest, Ill., 600 tons, Wieboldt department store.

Chicago, 100 tons, Goldblatt department store.

Chicago, 550 tons, division R for Sanitary District.

Chicago, 150 tons, superstructure for South Ashland Avenue viaduct.

Chicago, 700 tons, superstructure for Humboldt Park housing project.

Lombard, Ill., 100 tons, reservoir.

Gary, Ind., 200 tons, overhead crossing.

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La Salle, Colo., 100 tons, State overcrossing; bids June 22.

Mesa, Ariz., 350 tons, spillways at Horse Mesa dam, Specification No. 689; bids July 3.

Vernon, Cal., 175 tons, warehouse for Certified Grocers Association; bids opened.

Los Angeles, 100 tons, addition at Dana junior high school; bids opened.

Los Angeles, 150 tons, alterations at Albion school; bids opened.

Canoga, Cal., 100 tons, school auditorium; bids opened.

Seattle, 245 tons, State bridge on 15th Avenue N. E.; bids June 30.

Pasco, Wash., 228 tons, State undercrossing; bids June 30.

State of Washington, 133 tons, State bridge and overcrossing in Spokane and Lewis Counties; bids June 30.

. . . Pig iron arrearages continue.

o o o

. . . Tin plate cartel extended two years.

o o o

. . . Continental strikes may affect steel workers.

LONDON, June 15 (*By Cable*).—While pig iron deliveries are larger, arrears are still very heavy, and prompt business remains an impossibility. Great Britain is importing Russian and Indian iron in large quantities, and a further advance of 5s. on East Coast hematite is scheduled to take effect after July 1. An equal rebate will be allowed loyal customers.

Steel prices are firm. Inquiries are good, though business is limited by an insufficient supply of certain materials. Active conditions are assured up to and beyond December. Semi - finished steel is less scarce owing to large additional imports. A large demand exists from such industries as building, shipbuilding, engineering, and armament. Sheetmakers are specifying prices then ruling for deliveries after June, but no change is expected in export prices.

The international tinplate cartel has been definitely extended up to June 30, 1938. France and the Saar will probably make quota sacrifices in favor of Germany. The Welsh quota has been increased from 60 to 62½ per cent as, due to sanctions, Italy has been unable to fulfill her quota.

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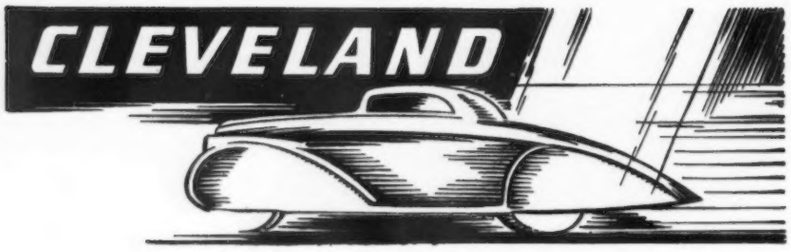

. . . Anticipatory buying at old prices seems to have passed peak.

° ° °

. . . Steel ingot production is unchanged at 76 per cent.

° ° °

. . . Wheeling & Lake Erie to buy freight cars.

CLEVELAND, June 16.—Demand for finished steel has been sustained by orders for current requirements and considerable forward buying in anticipation of the third quarter price advances. However, either because mills have taken all the tonnage they can produce during June or because they have covered practically all of their customers there is some evidence of a tapering off in new commitments.

Ingot output in the Cleveland-Lorain district is unchanged this week at 76 per cent of capacity and sheet and strip mills have full operating schedules.

The higher prices have not driven out as much tonnage as had been placed during some previous periods in anticipation of price advances. This is attributed both to the seasonal lull in the motor car industry and to the fact that many miscellaneous consumers are not placing heavy orders for stock as they do not feel that a $2 a ton price advance is a sufficient incentive to take in steel in any large volume.

The motor car manufacturers are buying steel only for finishing up their present models, although some of the parts makers are making considerable additions to their stocks. The heaviest buying in anticipation of higher prices has been in sheets, the business coming particularly from manufacturers of household equipment and the other products that seldom have changes in sheet sizes. Were the automobile manufacturers disposed to place large sheet tonnages for future requirements they would be unable to do so because they do not yet know the sizes the new models will take. The same is true of stamping plants doing automotive work.

Several of the sheet producers have virtually withdrawn from the market as they have all the tonnage on their books they can produce in June and some will not be able to ship all the steel ordered until July 15. Bar mills have accumulated considerable tonnage but expect to be able to ship all of this by June 30.

The Wheeling & Lake Erie railroad is in the market for 250 to 1000 hopper cars. An advance on rails, which is still talked of, doubtless would bring out some additional rail tonnages. The only new price announcement is the reaffirmation of distributers' prices on reinforcing bars in both new billet and rail steel, the present official prices being reestablished until further notice rather than for the third quarter.

Steel-making scrap has declined 50c. a ton, but blast furnace scrap is firmer.

Pig Iron

A good volume of activity in contracting for the third quarter, which was reported a week ago, is being maintained and some of the furnaces now have more tonnage on their books than for a long time. Considerable business still is pending. The much heavier forward buying than for the second quarter is attributed to low stocks in consumers' yards and the evident confidence of many consumers that their foundries will be fairly busy through the coming quarter. Shipments are holding up to recent volume. Demand is good from manufacturers of railroad equipment and from machinery builders, but is light from automotive foundries.

Bars, Plates and Shapes

Orders for merchant bars have come in fair volume from consumers who will stock up moderately at present prices. Most buyers are now under contract and activity has subsided. Inquiry in the construction field has been stimulated somewhat by the third quarter price advance. Price protection on identified jobs on which bids have been taken is being granted only for 30 days instead of for 60 days as heretofore customary. Public work is not coming out in any volume. Some good plate tonnage is in prospect for remodeling Lake boats.

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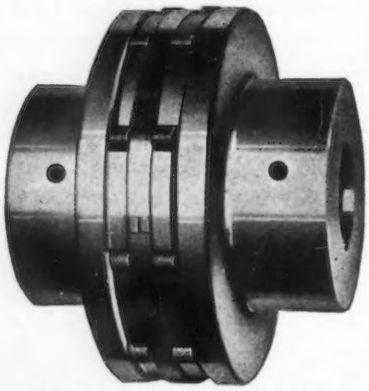

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Sheets

Bookings have been in heavy volume the past week as consumers have placed liberal specifications in order to secure deliveries at present prices. However, there has not been a great deal of speculative buying, the $2 a ton price advance for the third quarter not being sufficient to cause consumers to stock up for very extended requirements. Business has been widely diversified but not much has come from the automotive industry. The spurt of buying is now subsiding and some mills are so filled up that they have stopped taking orders for the current month except for hot-rolled material and for stock sizes of galvanized sheets. While producers will not be able to ship this month all the sheets taken at present prices, some will enter no more material than they can hot roll this month, doing the finishing operations and shipping early in July.

Strip Steel

Specifications for hot-rolled strip continue fairly heavy and mills are getting well filled up for material they can ship in June. Cold-rolled strip is not very active, there being no price advance on this material to stimulate sales and little new business from the automotive industry.

Bolts, Nuts and Rivets

The price advance for the third quarter is driving out considerable new business, which with the leading local manufacturer gained 20 per cent in the first half of June as compared with the corresponding period of May. Makers will accept orders against present contracts for shipment until about July 15. Shipping orders also will show a gain over May. Demand is good from railroads, implement manufacturers and jobbers and from various miscellaneous consumers, but is still slack from motor car manufacturers.

Reinforcing Bars

The question as to whether reinforcing bars would be advanced for the coming quarter seems to have been definitely settled by the announcement by several mills of the reestablishment of present prices. The prices as quoted by distributors are 2.05c., Pittsburgh, and 2.10c., Cleveland, Youngstown, Chicago and other basing points for new billet steel bars and 1.90c., Pittsburgh, and 1.95c., other basing points on rail steel bars. The new price announcements instead of stating that these prices are to apply for the third quarter, state that the prices are to remain in effect until further notice.

CAST IRON PIPE

York, Me., plans pipe lines for extensions in water system and other waterworks installation. Cost close to $100,000. Board of Water Commissioners is in charge.

Marlboro, Mass., has awarded 13,700 ft. of 6 and 8-in. to Warren Foundry & Pipe Corp., and 2000 ft. of 6-in. to a Johns-Manville subsidiary.

Charlestown, N. H., has awarded 13,000 ft. of 6-in. to United States Pipe & Foundry Co.

Maysville, Ky., plans pipe lines for water system and other waterworks installation. Financing will be arranged through Federal aid. Duke White, mayor, is active in project.

Waxhaw, N. C., plans pipe lines for water system and other waterworks installation. Fund of $38,000 is being arranged through Federal aid.

Quitman, Miss., plans early purchase of about 2000 ft. of 4-in. centrifugal pipe, with fittings.

Holloway, Ohio, will take bids soon for pipe for water system; also for elevated steel tank and tower and pumping station. Cost about $48,000. Jennings & Lawrence, 12 North Third Street, Columbus, Ohio, are consulting engineers.

Buffalo, S. D., plans pipe lines for water system and other waterworks installation. Application has been made for Federal aid for financing. Dakota Engineering Co., Western Building, Mitchell, S. D., is consulting engineer.

West Lincoln, Neb., plans about one and one-half miles of 12-in. for main water line from Lincoln, with number of smaller lines. Cost about $45,000. Scott & Scott, Bankers' Life Building, Lincoln, are consulting engineers.

Eagle Grove, Iowa, plans pipe lines for water system and other waterworks installation. Fund of $39,000 has been authorized.

Ridgeway, Colo., plans pipe lines for water system, including replacements in present mains. R. R. Boucher is town clerk.

Ontario, Cal., plans about 18,800 ft. of various sizes for water system. Appropriation of $26,380 has been secured through Federal aid.

San Francisco plans 10 to 12-in. for water supply for San Francisco Bay exposition site on Yerba Buena Shoals from connection with city trunk main in Embarcadero district, including pumping station with daily capacity of 2,500,000 gal., connecting with new 1,400,000-gal. reservoir on Yerba Buena Island. Financing has been arranged through Federal aid. Public Utilities Commission, Water Department, N. A. Eckart, chief engineer, is in charge.

Twentieth Century-Fox Film Corp., Hollywood, Cal., is understood to have purchased 200 tons for work in connection with new sound stages.

San Diego, Cal., has awarded 326 tons of 12 and 16-in. to United States Pipe & Foundry Co.

Alhambra, Cal., has placed 195 tons of 6 and 8-in. with United States Pipe & Foundry Co.

Stockton, Cal., will take bids June 24 on 192 tons of 8-in.

Bradley, Me., plans pipe lines for water system. Cost about $35,000. Financing will be arranged.

Scottsville, Ky., plans pipe lines for extensions in water system. Cost about $43,000. Financing has been arranged through Federal aid.

Purchasing and Contracting Officer, Holabird Quartermaster Depot, Baltimore, closes bids June 24 for black iron pipe (Circular 169).

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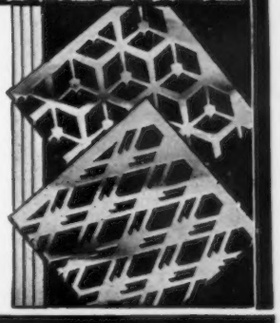

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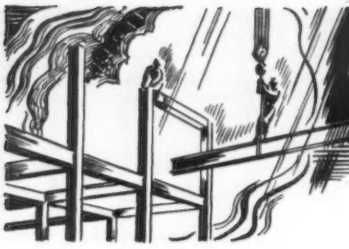

NEW YORK

. . . Steel buying approaches highest volume of year, as consumers attempt to anticipate third quarter requirements.

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. . . Some makers close books on sheets, but current backlogs already exceed June shipping facilities.

o o o

. . . Prices are advanced on tie plates, track bolts and spikes, tin mill black plate and long terne sheets.

NEW YORK, June 16. — The rush of consumers to place business at current prices brought the volume of finished steel orders coming to metropolitan sales offices last week to one of the highest levels of the year. The current week was begun in the same way, although the fact that producers of some finishes of sheets are now booked fully through June, and are accepting no more orders at second quarter prices, may soon call a halt to new buying.

However, tonnage already booked by many mills cannot possibly be shipped by the end of this month, and users who have contracts at current prices have the right to wait until June 30 before specifying against them. It is thus quite obvious that low-priced tonnage is certain to occupy mills during a large part of July and even early August.

The situation is somewhat different with respect to bars, plates and structural shapes for identified structures. On such projects contractors who take bids before June 30, have 30 days in which to place their orders, and specifications may, of course, be entered during the life of the job. Under the code this period of grace was 60 days, but has since been reduced. This factor has led to heavy inquiries on construction projects, tank work, etc.

Railroad interest has been accelerated by announcement of an advance of $2 a ton on tie plates and $3 a ton on track spikes and track bolts. The higher prices are effective Aug. 1, but tonnage entered prior to that date may be shipped until Sept. 30. These changes prompted the New York Central to ask for Clayton act bids June 26 on its second half requirements of rails and track supplies, but the tonnage to be bought has not been determined.

The New York Central will also take Clayton act bids June 25 on its regular quarterly requirements of rolled steel, but, as usual, the tonnage is not specified. Merchants Despatch, Inc., has placed 500 refrigerator cars with its East Rochester, N. Y., shops and will require 3000 tons of steel. American Car & Foundry Co. is reported to be contemplating the construction of 2000 tank cars for leasing purposes.

The Bethlehem Steel Co. has formally published the current prices of 2.05c., Pittsburgh, on reinforcing bars, and 2.60c., Pittsburgh, on cold-rolled strip steel. Other makers have advanced tin mill black plate $2 a ton to 2.85c., Pittsburgh, and long terne sheets, $2 a ton, to 3.50c., Pittsburgh. The new prices are effective July 1.

The tin plate market remains particularly tight and delivery on cold-rolled material is not available before Aug. 1 or later. Recent rains have greatly improved crop prospects in the East and thus contributed to the bullish aspect of the tin plate market.

Reinforcing Steel

No disposition has been made as yet of several attractive tonnages, and current enterprises in the market, therefore, are confined to individually small awards. The Treasury Department opened bids today on a Metropolitan job, taking approximately 50 tons. Nine identical bids were submitted, the low being $6 a ton under established prices. This would appear to be a last-minute hangover from earlier unsettled conditions, as latest developments point to firm prices ahead. Bethlehem Steel Co. has issued a published list of bar prices, the first incident of this kind to have taken place. Reinforcing bars are the same at $2.05, Pittsburgh, but for truck delivery to the Metropolitan area an additional charge of 10c. a 100 lb. is

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Pig Iron

Prompt buying of iron for consumption in this locality continues, but buyers are also taking some third quarter tonnage. With unchanged prices, there is not the incentive for users to cover heavily that is occurring with respect to steel. A moot factor in the situation has been and continues to be the problem of foreign brands, and there can be little doubt but that competition from import sources has deprived the domestic market of a relatively appreciable part of its natural outlet in this district.

. . . Large cast iron pipe award expected.

o o o

. . . Much state highway work pending.

SAN FRANCISCO, June 15.—Opening of bids for approximately 13,000 tons of cast iron pipe for the Los Angeles Department of Water and Power will headline Pacific Coast activity during the week. The East Bay Municipal Utility District has set a date for bids at Oakland, Cal., on 1130 tons of 4 to 16-in. After a dearth of business for several months the cast iron pipe market is starting to show signs of revival.

Lettings during the past week were limited in number and confined to scattered major tonnages. At Los Angeles the Department of Water and Power placed contracts for 7780 tons of plates for the Stone Canyon pipe line with Emsco Derrick & Equipment Co. and 1442 tons of 24 and 36-in. electric fusion-welded pipe with Western Pipe & Steel Co. At Pullman, Wash., 300 tons of bars and 100 tons of shapes for a University dormitory went to Columbia Steel Co. and Isaacson Iron Works respectively.

New additions to the pending list consisted largely of State highway projects and school reconstruction work in southern California. The placing of the general contract on the live stock building, to be constructed near San Mateo, Cal., continues to be withheld; when let approximately 941 tons of reinforcing bars and 992 tons of structural steel will be involved. Although contracts have been awarded at Long Beach, Cal., on the reinforced concrete retaining wall the 1220 tons of bars required have not yet been purchased.

Despite an absence of construction contracts steel activity on the Coast continues at an excellent pace. Warehouse business is favorable due to increased demand from small manufacturers.

Columbia Gas & Electric Corp., 61 Broadway, New York, is completing negotiations for natural gas supply to Philadelphia Gas Works Co., Philadelphia, a subsidiary of United Gas Improvement Co., same place, and will make extensions in welded steel pipe line system from terminus of two main trunk lines in that district to connection with Philadelphia company system; latter company proposes to mix natural and artificial gas for local distribution and will build mixing plant. Negotiations also include furnishing of natural gas by Columbia company to four other subsidiary interests of United Gas Company, including Allentown-Bethlehem Gas Co., Allentown and Bethlehem, Pa.; Harrisburg Gas Co., Harrisburg, Pa.; Consumers Gas Co., Reading, Pa., and Lebanon Valley Gas Co., Lebanon, Pa. Welded steel pipes will be built to these points from connection with main line of Columbia company in State.

Brazos River Gas Co., Weatherford, Tex., operating local natural gas distribution system, plans steel pipe lines for extensions to other points in this vicinity and for replacements in number of present mains. Cost close to $40,000.

Canton, Kan., is arranging bond issue of $30,000 for steel pipe line system for gas distribution.

Dovan Oil Co., Cotton Exchange Building, Oklahoma City, Okla., has authorized installation of about 12,000 ft. of 4-in. welded steel pipe line in Kelly Street for oil transmission. E. D. Hill, Insurance Building, Oklahoma City, is consulting engineer.

Salem, Ore., is arranging for early sale of $1,000,000 bond issue for extensions in water system, including about 17½ miles of 30 and 36-in. steel pipe for gravity water line from North Santiam River to city limits, new 10,000,000-gal. water filtration plant and other waterworks installation. Bids will be asked soon. Stevens & Koon, Spalding Building, Portland, are consulting engineers.

Dominion Gas & Electric Co., Ltd., Edmonton, Alta., plans about six miles of 12¾-in. steel pipe for extensions in gas transmission system, including replacements in existing mains. Company is also considering new welded steel pipe line from natural gas field district at Viking for main trunk line, connecting with present lines near city.

Los Angeles plans number of steel pipe lines for main water supply, including 10,000 ft. of 52-in. in Roscoe Street and Havenhurst Avenue; about 1400 ft. of 40-in. in Elysian Reservoir district; 37,300 ft. of 24 and 36-in. in Cantara, Radford and other streets in that area; 2100 ft. of 30-in. in connection with Buena Vista pumping station for extension to San Fernando Road; about 750 ft. of 24-in. in Sawtelle Reservoir area; about 11,500 ft. in Ventura Boulevard, size to be determined; also for about 20,400 ft. cast iron pipe, 16 to 24-in., in different streets. Work will be carried out by close of year, including several new pumping plants and other waterworks installation.

PHILADELPHIA

. . . District operations advance three points to 46 per cent.

o o o

. . . Consumers rush in second quarter orders.

o o o

. . . Full July deliveries on low-price tonnages.

PHILADELPHIA, June 16.—Steel sales at advanced third quarter price levels have been negligible so far. Practically any buyer can still enter orders for almost any type of steel at current price levels. Although mills do not permit these buyers to specify protracted delivery, the same end is approximated when mills retain the right to ship at their convenience. There is a general admission that this convenience will extend through July, and, as is the usual case for such indefinite transition periods, it is possible that favored customers may receive shipments even later.

Sellers have yet shown no tendency to publicly establish a firm dead line on second quarter business. Of course, July 1 is by public admission such a dead line, but whether books will keep open until that date or close a few days earlier is currently indeterminable. The former is the more likely. New business of a protective nature has been perceptibly increased during the past seven-day period. However, this surge of business has not been exceptionally heavy.

Expanding backlogs, and the necessity of liquidating much of this tonnage over the next month, is reflected in improved mill operations in eastern Pennsylvania. Central Iron & Steel Co. has four furnaces on and expects no decline for some weeks, Worth is operating two, Phoenix may add a third during the current week, and Alan Wood will probably be using four furnaces during the next month. Bethlehem's operations are slightly improved and all other district mills are holding their own. The eastern Pennsylvania rate is three points higher at 46 per cent, as compared with 32 per cent for the same period a year ago.

Pig Iron

Jobbing foundries are maintaining production, and, in some instances, orders for castings have tended to improve. For the most part, all district stocks are fairly well liquidated. However, neither buyer nor seller anticipates any tendency to rebuild stocks for the trade is pretty well committed to the policy of small hand-to-mouth ordering for quick shipment. This policy would only be altered by an impending price increase. Several furnaces are still trying to sound out market sentiment regarding such an advance for fourth quarter, but the reaction has been far from favorable in the East.

Bars, Plates and Shapes

Industrial building demands are fairly brisk. Single projects are not very impressive, but the aggregate turnover is moderately large and holding steady. There is a good volume of orders for light plate for tank and boiler work, but otherwise the plate market is spotty and unimpressive. Bookings for shapes and new projects for estimation are on the upturn. During the week, Bethlehem secured over 2000 tons of new fabricating business, Fort Pitt Bridge Works was awarded about 2500 tons and Belmont will supply 1150 tons of shapes. New highway and building projects and carryovers from past weeks amount to between 10,000 and 15,000 tons. The reinforcing bar market is moderately active, particularly for small lots. About 3000 tons of bars is active on old business, and late this week there will be lettings of 150 tons for North Carolina highway construction and 800 tons for a warehouse at Washington. The Bureau of Supplies and Accounts, Navy Department, is taking bids on quite a volume of steel. Tenders go in June 19 for 2122 tons of plates for various yards, 495 tons of plates on June 23 for the Brooklyn yard, and on June 26 bids will be opened for 1085 tons of shapes and 711 tons of rivet steel for various yards.

Sheets and Strip

Buyers are entering second quarter orders in sizable volume and mills are apparently willing to take this type of business up until the end of the month. Technically,

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there is a limitation on shipments for these low-priced tonnages, but actually the shipping instructions will probably be construed liberally. Sellers look forward to a brisk automobile steel demand in about one month. Currently, the roofing terne market is quite active, with demand centered at the Cumberland Valley, Pa., Virginia points and towns along the Sea Coast. The Federal Prison Industries took bids yesterday on about 100 tons of hot-rolled pickled sheets for delivery to Lewisburg, Pa.

Imports

The following iron and steel imports were received here last week: 5508 tons of chrome ore from Cuba; 2103 tons of chrome ore from Portuguese Africa; 1997 tons of pig iron from British India; 444 tons of steel sheets from Germany; 107 tons of steel tubes, 14 tons of steel forgings, 27 tons of CDS wire, 3 tons of drill steel, 5 tons of steel billets and 42 tons of steel bars from Sweden.

BUFFALO

. . . Third quarter pig iron contracting proceeding.

o o o

. . . Ingot production well maintained.

BUFFALO, June 16. — Pig iron contracting for third quarter is proceeding with some sizable lots being moved. Individual orders range from small parcels up to 1000, 2000 and 2500 tons. Producers say that most users of pig iron in the state have busy schedules of operations ahead and are purchasing sizable quantities of iron, but the method of purchase continues to be via private negotiation instead of the open inquiry, which marked the pre-depression years.

Mill operations are on a stronger basis than last week, with Bethlehem's Lackawanna plant operating 22 open hearths; Republic Steel Corp., seven, and Wickwire-Spencer, two. Seneca sheet division of Bethlehem is operating at 85 per cent of capacity.

Lettings of reinforcing bars in connection with Buffalo sewer work will occur on June 23 and 26. The latter letting will be for a 100-ton job; the former in excess of 100 tons.

BIRMINGHAM

. . . Week's steel orders are third best of year.

o o o

. . . Rail mill to end run this week.

BIRMINGHAM, June 16.—Steel orders showed an improvement last week. For one producer it was the third best week of the year, the other two surpassing it on account of rail tonnage. The new business was diversified and took in both light and heavy products. Larger current requirements, rather than the prospective increase in prices, were responsible for the pick-up, although the price factor is expected to stimulate orders from now until the end of the month.

Spot pig iron buying is sluggish, but third quarter orders are gradually accumulating. Melters are slow in making commitments for the next quarter, since the price is unchanged.

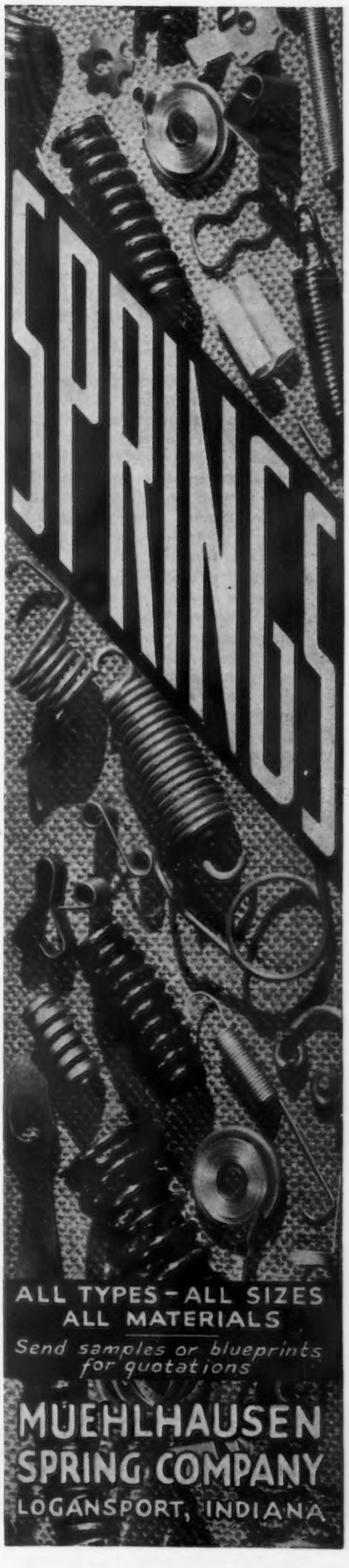
The Ensley rail mill is to run through June 20. Several small orders have been received including 1200 tons for the Oakland Bay Bridge and 325 tons from the Georgia Light & Power Co. When the rail mill is closed, two blast furnaces will be taken out of production. The three open-hearths and two remaining blast furnaces at Ensley will continue for a while.

Furnace operations were unchanged last week and there will be no change this week, with 12 blast furnaces and 15 open-hearth units operating.

The ore mines of the Tennessee Coal, Iron & Railroad Co. remain closed. Negotiations between the company and union have not yet brought an agreement. Only part of the mining force went out on a strike, but when violence flared up the mines were closed. An ample supply of ore is on hand for the furnaces.

Last week the Louisville & Nashville railroad called back 250 men to its Birmingham shops for repair work on freight cars.

Pressure pipe operations are lagging. New business has been light, but releases are now being made on old bookings.



CINCINNATI

. . . Pig iron buying continues to be in small lots.

o o o

. . . Price increases fail to effect steel orders.

CINCINNATI, June 16.—Lack of price incentive retards new pig iron purchasing. Melters are buying as the need presents itself, but only in quantities up to 100 tons. Even at this rate, the market average of better than 1000 tons a week is being maintained. While furnace interests adhere to current quotations, some rumor of price advance is heard.

Foundry operations reflect the influence of seasonal decline. With one or two exceptions, machine tool foundries are running full weeks, but stove and automobile melters have reduced operations to two and three days a week. The heating foundries are also running for stock so that current operations do not reflect current demand alone.

Shipments of foundry coke have eased from previous levels under the influence of a lighter melt. The withdrawal of one interest from the market has failed to offset supply, since available substitute stocks are adequate.

Sheet steel demand is tapering as third quarter approaches. The trade generally feels that this is the beginning of the customary summer lull and that price increases on July 1 will have no effect upon business.

Purchasers show no rush to cover before the new prices become effective, mills reporting bookings to be within capacity operations. Backlogs are not large, and little, if any, carryover is anticipated. Galvanized sheets are reacting upward under normal seasonal influences. Rolling schedules are near capacity.

ST. LOUIS

. . . Brisk demand for steel products continues.

o o o

. . . Stove foundries go on summer schedules.

ST. LOUIS, June 16.—Business in most items of finished iron and steel continues at a brisk rate, as the result of a desire of buyers to cover so that deliveries may be made before recent price advances become effective. In addition to items sold to the manufacturing trade using steel products, last week showed a marked pick-up in the buying of structural shapes.

There has been a slight lull in buying of galvanized sheets and wire products. Fabricating plants in the St. Louis district are operating at an average of about 50 per cent of capacity.

American Steel Foundries resumed operations today at its plant in East St. Louis, which had been idle since September, 1934. One furnace is being operated.

Buying of pig iron is mostly on a spot basis, and shipments are being well maintained. The stove foundries dropped to a five-day basis of operations yesterday, the schedule to continue until Sept. 15, as a result of a long standing agreement with molders. Warmer weather later is likely to make for further curtailment. Forward bookings are said to be heavier than for some time.

BOSTON

. . . Pig iron buying is heaviest in some time.

o o o

. . . Industrial activity generally is off slightly.

BOSTON, June 16.—Pig iron buying is more active, with the bulk of recent business having gone to Mystic Iron Works. The largest transaction was 2000 tons taken by a steel mill, and second largest was 500 tons by a central Massachusetts melter. Aggregate sales were around 3500 tons, the largest in some time. So far there has not been the customary summer letdown in the melt, but rather a betterment. Large foundries feel their position is more encouraging than for a long time, but admit future bulk castings orders are in the tentative stage.

Industrial New England collectively has experienced a slight setback, but as compared with a year ago it is 10 to 15 per cent more active. The bulk of passing reinforcing steel bar business is in small lots, the prospects of higher prices having failed to stimulate demand. Steel fabricators are doing fairly well, although some round tonnages bid some time ago are slow in closing.

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TEST THIS WELDING TORCH FREE FOR TWO WEEKS IN YOUR PLANT

. . . *Awards of 25,410 tons and new projects of 18,455 tons.*

NORTH ATLANTIC STATES

Northfield, Mass., 400 tons, Central Vermont bridge, to American Bridge Co.

Caribou, Me., 202 tons, two bridges over Eyer Brook, to American Bridge Co.

Worcester, Mass., 100 tons, Consolidated Street Railway machine shop, to New England Structural Co.

Ansonia, Conn., 110 tons, beam trestle for Farrel-Birmingham Co., to American Bridge Co.

Albany, N. Y., 575 tons, mill building for A. P. W. Paper Co., to American Bridge Co.

Syracuse, N. Y., 410 tons, railway express building for New York Central Railroad, to American Bridge Co.

Elmont, N. Y., 130 tons, Sewanhaka high school, to Bethlehem Fabricators, Inc.

New York, 360 tons, post office annex D., to Norton Steel Co., steel to be fabricated by Weatherly Steel Co.

Brooklyn, 190 tons, Good Shepherd school, to Joseph T. Ryerson & Son, Inc.

Manville, N. J., 635 tons, cement manufacturing plant, to Bethlehem Steel Co.

Philadelphia, 2600 tons, school at 24th and Master Streets, to Fort Pitt Bridge Works Co.

Lancaster, Pa., 200 tons, college building, to A. B. Rote Co.

Schuylkill County, Pa., 690 tons, State highway bridge, to Phoenix Bridge Co.

St. Marys, Pa., 105 tons, factory building for Stackpole Carbon Co., to Guibert Steel Co.

Pittsburgh, 9800 tons, sheet-strip mill building for Jones & Laughlin Steel Corp., divided among Fort Pitt Bridge Works Co., Keystone works of Jones & Laughlin Steel Corp., and Levinson Co., Pittsburgh.

Cumberland, Md., 220 tons, stock house addition for Cumberland Brewing Co., to Bethlehem Steel Co.

Washington, 1460 tons, two highway bridges, to Bethlehem Steel Co.

SOUTH AND SOUTHWEST

Nitro, W. Va., 1150 tons, building for Viscose Co., to Belmont Iron Works.

Orleans Parish, La., 955 tons, overpass, to Jones & Laughlin Steel Corp.

St. Tammany Parish, La., 220 tons, bridge, to Jones & Laughlin Steel Corp.

Imboden, Ark., 500 tons, bridge, to Virginia Bridge Co., previously reported awarded to Muskogee Iron Works.

CENTRAL STATES

Flint, Mich., 285 tons, building extension for Buick Motor Co., to Flint Structural Steel Co.

Detroit, 600 tons, press shop addition for Chrysler Corp., to R. C. Mahon Co.

Dearborn, Mich., 680 tons, oven bin and conveyor for Ford Motor Co., to Whitehead & Kales, Inc.

Decatur, Ill., 240 tons, oil refinery building, to Mississippi Valley Structural Steel Co.

Quincy, Ill., 410 tons, foundry building, to Michelman Steel Construction Co.

Manitowoc, Wis., 200 tons, junior high school, to Mississippi Valley Structural Steel Co.

Benton County, Mo., 505 tons, highway bridge, to Wisconsin Bridge & Iron Co.

Isanti County, Minn., 105 tons, highway bridge, to Minneapolis-Moline Power Implement Co.

Ramsey County, Minn., 205 tons, highway bridge, to Lakeside Bridge Co.

Jansen, Neb., 265 tons, State highway bridge, to Omaha Steel Works.

WESTERN STATES

State of Colorado, 130 tons, Taylor Park dam, to John W. Beam Co.

State of Wyoming, 155 tons, bridge over Shoshone River, to Wisconsin Bridge & Iron Co.

State of Wyoming, 170 tons, bridge over Elk Fork River, to Wisconsin Bridge & Iron Co.

Northern Pacific Railroad, 250 tons, bridge for Montana Division, to American Bridge Co.

State of California, 710 tons, bridge over All-American Canal, to Virginia Bridge Co.

San Bernardino, Cal., 210 tons, auditorium for San Bernardino junior college, to Pacific Iron & Steel Co.

Pullman, Wash., 100 tons, women's dormitory at Washington State College, to Isaacson Iron Works.

King County, Wash., 168 tons, State undercrossing at Black River Junction, to Pacific Car & Foundry Co.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

Boston, 125 tons, Eastern Massachusetts Street Railway bus terminal.

Pittsfield, Mass., 100 tons, State bridge.

State of New Hampshire, 1100 tons, two bridges for the Boston & Maine Railroad.

State of New York, 675 tons, four highway bridges.

Sayreville, N. J., 400 tons, building for the Titanium Pigment Co.

Winans, Md., 1000 tons, highway bridge, bids June 26.

Crawford County, Pa., 700 tons, highway bridge.

Erie County, Pa., 160 tons, bridge.

SOUTH AND SOUTHWEST

Calhoun, Tenn., 1500 tons, transmission towers for TVA.

New Orleans, 800 tons, grade crossing.

Atlanta, Ga., 650 tons, addition to Chevrolet assembly plant.

Mesa, Ariz., 230 tons, spillway gates at Horse Mesa dam, Specification No. 689; bids July 3.

CENTRAL STATES

Cleveland, 300 tons, Granger Road bridge.

St. Bernard, Ohio, 275 tons, building for the Cincinnati Chemical Co.

State of Michigan, 650 tons, grade separation.

Detroit, 500 tons, factory building, Borg-Warner Corp.

Detroit, 650 tons, State highway bridge.

State of Indiana, 850 tons, bridges; bids June 23.

Streator, Ill., 1000 tons, factory building for Owens-Illinois Glass Co.

Screenlike Concealment
Maximum Free Air Opening

The new Wissco designs meet every requirement for Decorative Perforated Metal. They are not only attractive in appearance but set a new standard of maximum concealment with minimum resistance to the flow of air.

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37 East 42nd St., New York City
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Send for a copy of "Wissco Decorative Perforated Metals."

WICKWIRE SPENCER
perforated metals

Lake Forest, Ill., 450 tons, bridge; American Bridge Co., low bidder.

Chicago, 500 tons, control works at mouth of Chicago River.

Quincy, Ill., 3100 tons, dam across Mississippi River.

Sugar Grove, Ill., 200 tons, bridge; Worden-Allen Co., low bidder.

Santa Fe Railway, 200 tons, bridges.

Oshkosh, Wis., 800 tons, Wisconsin Avenue bridge over Fox River; survey started.

State of Wisconsin, 155 tons, bridge in Dunn County; L. G. Arnold, Inc., Eau Claire, Wis., general contractor.

Mosher, Mo., 600 tons, rotary kiln.

WESTERN STATES

State of Colorado, 300 tons, bridges; bids June 22.

La Salle, Colo., 242 tons, State overpass; bids June 22.

Pasco, Wash., 280 tons, State undercrossing; bids June 30.

Centralia, Wash., 113 tons, State overcrossing; bids June 30.

FABRICATED PLATES

AWARDS

Brewer, Me., 375 tons, five tanks for Tide Water Oil Co., to Hammond Iron Works.

New Orleans, 500 tons, 80 dredge pontoons for United States Engineers Office, to St. Louis Shipbuilding Co.

Dearborn, Mich., 322 tons, oven steel work for Ford Motor Co., to an unnamed fabricator.

Green Bay, Wis., 200 tons, gas holder for sewage treatment plant, to Chicago Bridge & Iron Works.

St. Louis, 120 tons, dredge pipe for United States Engineers Office, to Treadwell Construction Co.

Los Angeles, 1442 tons, 24 and 36-in. pipe for Department of Water and Power, to Western Pipe & Steel Co.

NEW PROJECTS

Random Lake, Wis., 100 tons, water tank and tower; Pittsburgh-Des Moines Steel Co., low bidder.

San Francisco, 430 tons, Pilarcitos and Stone Dam aqueducts; bids June 24.

Better Rails

(CONCLUDED FROM PAGE 39)

cumstances. The gradual transmission of the load over the joint is very effective in protecting the insulating fiber.

This article has been confined to certain improvements in rails after they have been given their final form as rolled products. It leaves untouched the manifold advances in steel making and shaping. From the blast furnace to and through the rail mill there has been an increasing application of scientific knowledge for the purpose of controlling and governing the multifarious chemical, metallurgical, and thermal factors involved in the manufacture of rails for track service. Metal and slag analyses, mold preparation and use, design and operation of furnaces, temperature control of rolling, and chemical and metallographic checks, all have contributed to the steady advance of rail manufacture. All of this care in preparing good steel and rolling it into a rail should not be vitiated by neglect in the subsequent treatment, thereby lessening its value as a safe and serviceable product for the use of our railroads. Nevertheless it still remains axiomatic that a good rail can be made only from good steel.

. . . May copper statistics reflect strong position.

o o o

. . . Lead steady, but zinc sales recede.

o o o

. . . Tin very weak; international outlook cloudy.

NEW YORK, June 16.—Light sales of copper for domestic use continue, with 538 tons booked yesterday and 7604 tons booked in the month so far. Export business is reported moderate, and today's price equivalent on electrolytic is about 9.10c. a lb., c.i.f., European ports. The domestic quotation remains at 9.50c. Connecticut Valley. A recent feature was the release of official May sta-

The Week's Prices. Cents Per Pound for Early Delivery

	June 10	June 11	June 12	June 13	June 15	June 16
Electrolytic copper, Conn.*	9.50	9.50	9.50	9.50	9.50	9.50
Lake copper, N. Y.	9.62½	9.62½	9.62½	9.62½	9.62½	9.62½
Straits tin, Spot, New York	42.12½	42.62½	42.50	....	41.50	42.62½
Zinc, East St. Louis	4.90	4.90	4.90	4.90	4.90	4.90
Zinc, New York†	5.27½	5.27½	5.27½	5.27½	5.27½	5.27½
Lead, St. Louis	4.45	4.45	4.45	4.45	4.45	4.45
Lead, New York	4.60	4.60	4.60	4.60	4.60	4.60

*Delivered Connecticut Valley; price ¼c. lower delivered in New York.
†Includes emergency freight charge.

Aluminum, virgin 99 per cent plus, 19.00c.-21.00c. a lb., delivered.
Aluminum, No. 12 remelt No. 2 standard, in carloads, 17.00c. lb., delivered.
Nickel, electrolytic, 35c. to 36c. a lb. base refinery, in lots of 2 tons or more.
Antimony, Asiatic, 13.00c. a lb., New York.
Quicksilver, $74.50 to $75.50 per flask of 76 lb.
Brass ingots, commercial 85-5-5-5, 9.25c. a lb., delivered; in Middle West ¼c. a lb. is added on orders for less than 40,000 lb.

From New York Warehouse

Delivered Prices, Base per Lb.

Tin, Straits pig	44.00c. to 45.00c.
Tin, bar	46.00c. to 47.00c.
Copper, Lake	10.25c. to 11.25c.
Copper, electrolytic	10.25c. to 11.25c.
Copper, castings	10.00c. to 11.00c.
*Copper sheets, hot-rolled	17.00c.
*High brass sheets	15.12½c.
*Seamless brass tubes	17.37½c.
*Seamless copper tubes	17.50c.
*Brass rods	13.12½c.
Zinc, slabs	5.75c. to 6.75c.
Zinc, sheets (No. 9), casks, 1200 lb. and over	10.25c.
Lead, American pig	5.10c. to 6.10c.
Lead, bar	6.10c. to 7.10c.
Lead, Sheets, cut	8.25c.
Antimony, Asiatic	14.00c. to 15.00c.
Alum., virgin, 99 per cent plus	23.30c.
Alum., No. 1 for remelting, 98 to 99 per cent	18.50c. to 20.00c.
Solder, ½ and ½	28.50c. to 29.50c.
Babbitt metal, commercial grades	25.00c. to 60.00c.

*These prices are also for delivery from Chicago and Cleveland warehouses.

From Cleveland Warehouse

Delivered Prices Per Lb.

Tin, Straits pig	45.50c.
Tin, bar	47.50c.
Copper, Lake	10.25c. to 10.50c.
Copper, electrolytic	10.25c. to 10.50c.
Copper, castings	10.00c. to 10.25c.
Zinc, slabs	6.50c. to 6.75c.
Lead, American pig	5.20c. to 6.50c.
Lead, bar	8.50c.
Antimony, Asiatic	15.00c.
Babbitt metal, medium grade	19.00c.
Babbitt metal, high grade	49.50c.
Solder, ½ and ½	24.75c.

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	7.37½c.	8.12½c.
Copper, hvy. and wire	7.25	7.75c.
Copper, light and bottoms	6.25c.	6.75c.
Brass, heavy	4.12½c.	4.75c.
Brass, light	3.37½c.	4.12½c.
Hvy. machine composition	6.12½c.	6.62½c.
No. 1 yel. brass turnings	5.12½c.	5.62½c.
No. 1 red brass or compos. turnings	5.75c.	6.25c.
Lead, heavy	3.62½c.	4.00c.
Sheet aluminum	13.25c.	14.75c.
Zinc	2.50c.	2.87½c.
Cast aluminum	12.12½c.	13.25c.

tistics. These showed the industry's domestic deliveries to consumers were 65,900 tons, against 50,757 tons for April. Apparent consumption was 59,906 tons, compared with April's 59,704 tons. Refined production was negligibly higher at 59,374 tons, but mine output declined more than 7000 tons to 41,289 tons. Total refined stocks declined about 3500 tons to 230,202 tons at the close of May, while total world refined stocks dropped approximately 4900 tons to 466,132 tons.

Lead

Buying in the past fortnight has been rather quiet, and little change is expected this week. Next week, however, demand should strengthen on the basis of better July coverage. Practically all recent sales have been for June shipment, although earlier commitments on this position were heavy. The tonnage already taken for June delivery has exceeded May's entire volume, and has run well ahead of June a year ago. Sellers estimate that total June deliveries will surpass May by a comfortable margin. Prices for lead are holding unchanged at 4.45c. a lb., St. Louis, and 4.60c., New York.

Zinc

A quiet tone prevails, with the volume of new business last week about half that of the preceding period. The figures were 2517 tons of Prime Western sold and 3850 tons shipped. Unfilled orders took a further drop. Buying may have slowed on a poorer showing of zinc abroad, for, while the domestic galvanizing industry is approaching its dull season, good activity in steel would indicate some strength in consumption of zinc. One lot is rumored to have changed hands last week at a concession, but private reports circulated among trade members failed to attest the fact. Domestic prices hold at 4.90c. a lb., East St. Louis.

Tin

News that the Siamese Government may decide not to support further regulation of the industry in that country has increased doubts about renewal of restriction, and quota worries are an added trouble. As a result, London has grown nervous, and pressure to sell has ensued, forcing prices down. Transmitted to this side of the Atlantic, such forces have induced cautiousness, and buyers have been few. Spot Straits at New York touched low yesterday at 41.50c. a lb., but today is up to 41.62½c. London quotations are £181 standard spot and £179 15s. futures. The Eastern price is £181 7s. 6d.

Steel Corporation Ships Largest May Tonnage Since 1930

DURING May the United States Steel Corp. shipped 984,097 tons of finished steel products. This was 4190 tons higher than the 979,907 tons moved the month before and 385,182 tons above the 598,915 volume of May, 1935. At the same time, shipments were the highest of any month since June, 1934, when deliveries aggregated 985,337 tons. They were the highest for any May since 1930, when a total of 1,203,916 tons was shipped.

The total from January through May of this year was 4,145,285 tons, as against 2,975,891 tons comparably during 1935, a gain of about 39½ per cent. As between individual months, the May, 1936, figure was approximately 64½ per cent greater than that for May, 1935.

Based on the above tonnage, finished steel making facilities of the corporation were engaged at 63.4 per cent of capacity during May. In April the rate was 0.2 points lower at 63.2 per cent, while in May, 1935, it was 27.6 points lower at 35.8 per cent. Although volume of shipments in June, 1934, was higher (985,337 tons), operations averaged 2.2 points lower at 61.2 per cent of capacity. This was because the corporation's total capacity is smaller today than it was in 1934.

MONTHLY SHIPMENTS OF STEEL PRODUCTS BY UNITED STATES STEEL CORP.

	1933		1934		1935		1936	
Month	Shipments	Per Cent of Capacity	Shipments	Per Cent of Capacity	Shipments	Per Cent of Capacity	Shipments	Per Cent of Capacity
January	285,137	17.7	331,777	19.8	534,055	31.9	721,414	44.8
February	275,929	18.5	385,500	25.9	583,137	39.2	676,315	45.3
March	256,793	15.3	588,209	35.2	668,056	41.5	783,552	50.5
April	335,321	21.6	643,009	41.5	591,728	36.7	979,907	63.2
May	455,302	27.1	745,063	44.5	598,915	35.8	984,097	63.4
June	603,337	37.4	985,337	61.2	578,108	36.7	.....	...
July	701,322	45.1	369,938	23.9	547,794	34.0	.....	...
August	668,155	39.8	378,023	22.6	624,497	37.3	.....	...
September	575,161	35.6	370,306	23.9	614,933	39.7	.....	...
October	572,897	35.5	343,962	20.6	686,741	41.1	.....	...
November	430,358	26.7	366,119	22.7	681,820	42.3	.....	...
December	600,639	38.7	418,630	27.0	661,515	42.7	.....	...
Plus or minus yearly adjustment	(44,283)	...	(19,907)	...	.....	...	.....	...
Total for year..	5,805,235	30.1	5,905,966	30.6	7,371,299	38.3	.....	...

NOPAK VALVES

An air leak equal to 1/16" diameter hole costs $28.00 per month. Air is expensive, control it efficiently and accurately with a NOPAK valve —a patented leak-proof valve guaranteed to stay tight without maintenance. Its flat, patented disc together with a packless spindle prevents sticking and assures you of many years of leak-proof operation. Permits throttling or quick opening. Easy to operate. Seat protected at all times and cannot wear out. NOPAK valves are suitable for air, gas, water, or oil. *Write for Bulletins.*

Made in shut-off, three-way and four-way styles ¼" to 2" pipe openings, three and four-way for operating single and double acting cylinders.

GALLAND-HENNING MANUFACTURING COMPANY
2724 S. 31st Street Milwaukee, Wisconsin

ALSO COMPLETE LINE OF BALERS: *Electric and Hydraulic, also* HYDRAULIC PRESSES and PUMPS

. . . Pittsburgh rises force composite up 8c. to $12.75 gross ton.

o o o

. . . All markets show signs of steadiness, and some buying interest returns.

o o o

. . . Export market improves slightly.

JUNE 16.—A nominal rise in the Pittsburgh market, based on dealer purchases to cover outstanding orders, is reflected in an advance in the composite from $12.67 to $12.75. This increase has little significance and hardly presages widespread recovery in scrap, but it does effectively halt an eight-week period of successively declining quotations. The important Chicago market is still uncertain and none too encouraging, but eastern Pennsylvania has been enlivened by a little buying and prices there are moderately firm at current levels. Cleveland, Boston and Buffalo continue to be soft and listless.

Steel scrap is still being delivered to Italy on old orders, but England and Japan are still the principal outlets for foreign shipments. Poland and Hungary are taking small tonnages, and an Indian buyer is in the market for certain rerolling grades. Although little new export business has developed recently, this market will certainly revive as soon as the domestic situation gets firmer.

Pittsburgh

The market here is slightly stronger, with dealer sources at $13 having dried up some during the past week. In order to pick up steel in fairly good quantities, those dealers who have received $13.50 orders are obliged to pay $13.25, although in some cases an odd lot here and there is being purchased 25c. lower. Just previous to the $13.50 consumer sales, a purchase was made at a higher figure. However, the requirements by the mill were so strict as to place the steel close to a railroad category. There is a short interest in this particular sale, with the result that in some cases $13.75 is being offered to cover. As a result of these factors, the average price is close to $13.50, and the ranges have been marked up 25c., making No. 1 steel quotable at $13.25 to $13.75.

Chicago

Brokers' buying prices are somewhat stronger, but consumers remain out of the market. The probable course of prices over the next few weeks is uncertain inasmuch as the few signs of strength showing in the Chicago area are being offset by reports of weakness in eastern markets. The inflow of supplies is ample for all requirements, and in one case a mill has restricted incoming shipments while it works on old accumulations which it has had on hand for some time. There is an active boat movement into this area, the bulk of the tonnage coming from Duluth where accumulations have proved to be much larger than brokers had anticipated.

Cleveland

Heavy melting steel and other steel making grades have declined 50c. a ton, reflecting the recent reduction in prices in the Pittsburgh and Valley districts. On the other hand, blast furnace scrap, which is not very plentiful, is firmer. The probable price trend is currently difficult to estimate. Brokers at present are paying higher prices to fill old orders than the mills are willing to pay and the latter evidently look for a softening in quotations should steel plant operations taper off in the next few weeks. Considerable scrap, mostly in steel making grades, is being shipped to Cleveland by water from various lake ports, including some Canadian scrap.

Philadelphia

This market has thrown off some of the lethargy of the past several weeks. Worth Steel Co. has divided a small tonnage of No. 1 between two local brokers, and Phoenix is taking deliveries on a moderate tonnage of the same grade to supplement its usual No. 2 purchases. Both these orders total only about 5000 tons, but, more important, they were taken at a $12 price level. Thus these first tests in quotations for several weeks have shown the market as being entrenched fairly steadily at a flat $12 figure. Alan Wood is temporarily holding up No. 2 deliveries, but all other district mills are sending in releases on old orders. Bethlehem continues to purchase from dealers frequently and in sizable amounts. Port Richmond is still an outlet for No. 1 at $11, but purchases are none too heavy as brokers prefer to fill orders at other coastal points.

Buffalo

The largest consuming interest in this district has reduced its price for No. 1 to $12. In sympathy, No. 2 is down to $10.50. Another mill has purchased 2000 tons of No. 1 at $12, between 2500 and 5000 tons of stove plate has been sold at $10.75. A recent malleable transaction has established this grade at $14.50 to $15.

Boston

Although not active, enough of some kinds of scrap is moving from here to the Pittsburgh district to establish prices. No. 1 steel has sold in a small way at $14 a ton, delivered, steel turnings for the most part at $3.25 to $3.40, f.o.b., skeleton or busheling at $6 to $6.25, on cars, and shafting at $13 to $13.50. Prices for Nos. 1 and 2 steel for export are firm and unchanged, but steel turnings are easier, with the bulk of the movement earmarked for Italy.

New York

Current turnover is fairly brisk, and the market's price undertone is comparatively steady. The delivery of steel to dealers for processing has tapered off considerably during the past two weeks, but there is still plenty of supplies for current export and domestic accounts. Brokers' bids for No. 1 and No. 2 alongside barges are unchanged at $9.25 and $8 respectively. No. 1 and No. 2 steels are leaving Jersey points at about 75c. higher for Bethlehem, Claymont and Coatesville.

St. Louis

The scrap iron market has a firmer tone, and some items have been sold at higher levels. Offerings by country dealers are getting much lighter, and the dealers here feel that prices are due for an advance on the next buying movement. There are no railroad lists pending. Miscellaneous standard section rails and railroad springs are 25c. higher and rail for rolling and steel rails under 3 ft. are 50c. a ton higher, while No. 2 steel is 25c. lower and rail road malleable 50c. less than a week ago.

Cincinnati

The market is slightly softer, and dealers have reduced all bids 50c. during the past week. Despite this, quotations are considered merely formal since mills refuse to purchase except at even more attractive prices. Some foundry grades were sold in small lots the past week, but demand for steel scrap is negligible.

Iron and Steel Scrap Prices

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$13.25 to $13.75
No. 2 hvy. mltng. steel.	12.25 to 12.75
No. 2 RR. wrought....	13.25 to 13.75
Scrap rails	13.50 to 14.00
Rails, 3 ft. and under..	16.00 to 16.50
Comp. sheet steel.....	13.25 to 13.75
Hand bundled sheets..	12.25 to 12.75
Hvy. steel axle turn...	11.75 to 12.25
Machine shop turn....	9.00 to 9.50
Short shov. turn.....	9.25 to 9.75
Mixed bor. & turn. ...	7.50 to 8.00
Cast iron borings.....	10.00 to 10.50
Cast iron carwheels...	13.50 to 14.00
Hvy. breakable cast..	12.50 to 13.00
No. 1 cast	14.50 to 15.00
R.R. knuckles & cplrs..	16.50 to 17.00
Rail. coil & leaf springs	16.50 to 17.00
Rolled steel wheels....	16.50 to 17.00
Low phos. billet crops.	17.50 to 18.00
Low phos. sh. bar.....	17.00 to 17.50
Low phos. punchings.	16.25 to 16.75
Low phos. plate scrap.	16.00 to 16.50
Steel car axles	15.50 to 16.00

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$12.50 to $13.00
No. 2 hvy. mltng. steel.	11.50 to 12.00
Comp. sheet steel	11.50 to 12.00
Light bund. stampings	8.50 to 9.00
Drop forge flashings...	11.50 to 12.00
Machine shop turn....	7.50 to 8.00
Short shov. turn.	8.25 to 8.75
No. 1 busheling	8.25 to 8.75
Steel axle turnings....	8.25 to 8.75
Low phos. billet crops	17.00 to 17.50
Cast iron borings	8.25 to 8.50
Mixed bor. & turn.....	8.25 to 8.50
No. 2 busheling	8.25 to 8.50
No. 1 cast	14.50 to 15.00
Railroad grate bars...	8.00 to 8.50
Stove plate	9.00 to 9.50
Rails under 3 ft.	16.00 to 16.50
Rails for rolling	16.50 to 17.00
Railroad malleable ...	17.00 to 17.50
Cast iron carwheels...	.... 15.50

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	.... $12.00
No. 2 hvy. mltng. steel.	.... 11.00
Hydraulic bund., new.	$12.00 to 12.50
Hydraulic bund., old..	9.00 to 9.50
Steel rails for rolling..	15.00 to 15.50
Cast iron carwheels...	13.50 to 14.00
Hvy. breakable cast...	12.50 to 13.00
No. 1 cast	13.50 to 14.00
Stove plate (steel wks.)	10.00 to 10.50
Railroad malleable ...	.... 16.50
Machine shop turn....	8.00 to 8.50
No. 1 blast furnace....	.... 6.25
Cast borings	.... 6.00
Heavy axle turnings..	11.00 to 11.50
No. 1 low phos. hvy....	16.00 to 16.50
Couplers & knuckles..	16.00 to 16.50
Rolled steel wheels....	16.00 to 16.50
Steel axles	16.00 to 16.50
Shafting	18.50 to 19.00
No. 1 RR. wrought....	14.50 to 15.00
Spec. iron & steel pipe	12.00 to 12.50
Bundled sheets	12.00 to 12.50
No. 1 forge fire	12.00 to 12.50
Cast borings (chem.)..	10.50 to 13.00

CHICAGO

Delivered to Chicago district consumers:

	Per Gross Ton
Hvy. mltng. steel.....	$12.50 to $13.00
Auto. hvy. mltng. steel	11.00 to 11.50
Shoveling steel	12.50 to 13.00
Hydraul. comp. sheets.	11.50 to 12.00
Drop forge flashings..	11.50 to 12.00
No. 1 busheling.....	11.50 to 12.00
Rolled carwheels	14.00 to 14.50
Railroad tires cut	14.00 to 14.50
Railroad leaf springs..	14.00 to 14.50
Axle turnings	12.00 to 12.50
Steel coup. & knuckles	14.00 to 14.50
Coil springs	15.00 to 15.50
Axle turn. (elec.).....	12.75 to 13.25
Low phos. punchings..	14.50 to 15.00
Low phos. plates, 12 in. and under	15.00 to 15.50
Cast iron borings	6.00 to 6.50
Short shov. turnings..	6.25 to 6.75
Machine shop turn....	5.50 to 6.00
Rerolling rails	14.00 to 14.50
Steel rails under 3 ft...	14.75 to 15.25
Steel rails under 2 ft...	15.25 to 15.75
Angle bars, steel	14.50 to 15.00
Cast iron carwheels ..	13.50 to 14.00
Railroad malleable ...	15.50 to 16.00
Agric. malleable	13.50 to 14.00
	Per Net Ton
Iron car axles	$17.50 to $18.00
Steel car axles	14.25 to 14.75
No. 1 RR. wrought....	11.50 to 12.00
No. 2 RR. wrought....	11.00 to 11.50
No. 2 busheling, old...	$7.50 to $8.00
Locomotive tires	12.00 to 12.50
Pipes and flues	8.00 to 8.50
No. 1 machinery cast..	12.00 to 12.50
Clean auto. cast	11.00 to 11.50
No. 1 railroad cast....	11.00 to 11.50
No. 1 agric. cast.....	10.00 to 10.50
Stove plate	7.00 to 7.50
Grate bars	8.50 to 9.00
Brake shoes	8.50 to 9.00

BUFFALO

Per gross ton, f.o.b. consumers' plants:

No. 1 hvy. mltng. steel.	$12.00 to $12.50
No. 2 hvy. mltng. steel.	10.50 to 11.00
Scrap rails	12.00 to 12.50
New hy. b'ndled sheets	10.50 to 11.00
Old hydraul. bundles..	10.00 to 10.50
Drop forge flashings..	10.50 to 11.00
No. 1 busheling	10.50 to 11.00
Hvy. axle turnings...	10.50 to 11.00
Machine shop turn....	6.50 to 7.00
Knuckles & couplers..	15.00 to 15.50
Coil & leaf springs....	15.00 to 15.50
Rolled steel wheels....	15.00 to 15.50
Low phos. billet crops.	15.50 to 16.00
Short shov. turnings..	9.00 to 9.50
Mixed bor. & turn.....	7.75 to 8.25
Cast iron borings.....	7.75 to 8.25
No. 2 bushelings	.... 6.50
Steel car axles	13.50 to 14.00
Iron axles	12.00 to 12.50
No. 1 machinery cast..	13.00 to 13.50
No. 1 cupola cast.....	12.00 to 12.50
Stove plate	10.50 to 11.00
Steel rails, under 3 ft.	15.75 to 16.25
Cast iron carwheels...	11.50 to 12.00
Railroad malleable	15.00 to 15.50
Chemical borings	9.00 to 9.50

BIRMINGHAM

Per gross ton delivered to consumer:

Hvy. melting steel....	$11.00 to $11.50
Scrap steel rails.....	11.50 to 12.00
Short shov. turnings..	.... 7.00
Stove plates	.... 8.00
Steel axles	12.00 to 12.50
Iron axles	12.00 to 12.50
No. 1 RR. wrought....	8.50 to 9.00
Rails for rolling	12.50 to 13.00
No. 1 cast	12.00 to 12.50
Tramcar wheels	11.00 to 12.00

ST. LOUIS

Dealers' buying prices per gross ton delivered to consumer:

Selected hvy. steel....	$12.00 to $12.50
No. 1 hvy. melting....	12.00 to 12.50
No. 2 hvy. melting....	9.75 to 10.25
No. 1 locomotive tires.	11.00 to 11.50
Misc. stand-sec. rails.	12.75 to 13.25
Railroad springs	13.75 to 14.25
Bundled sheets	9.50 to 10.00
No. 2 RR. wrought....	12.00 to 12.50
No. 1 busheling	7.50 to 8.00
Cast bor. & turn.....	4.00 to 4.50
Rails for rolling	14.00 to 14.50
Machine shop turn....	4.00 to 4.50
Heavy turnings	9.25 to 9.75
Steel car axles	13.00 to 13.50
Iron car axles	15.00 to 16.00
No. 1 RR. wrought....	10.50 to 11.00
Steel rails under 3 ft...	13.50 to 14.00
Steel angle bars	14.00 to 14.50
Cast iron carwheels...	11.00 to 11.50
No. 1 machinery cast.	11.00 to 11.50
Railroad malleable ...13.00 to 13.50	
No. 1 railroad cast....	11.00 to 11.50
Stove plate	7.50 to 8.00
Agricul. malleable	12.50 to 13.00

CINCINNATI

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. steel.	$9.50 to $10.00
No. 2 hvy. mltng. steel.	7.50 to 8.00
Scrap rails for mltng.	10.00 to 10.50
Loose sheet clippings.	5.25 to 5.75
Bundled sheets	7.25 to 7.75
Cast iron borings	4.50 to 5.00
Machine shop turn	5.25 to 5.75
No. 1 busheling	8.00 to 8.50
No. 2 busheling	3.75 to 4.25
Rails for rolling	10.50 to 11.00
No. 1 locomotive tires	9.00 to 9.50
Short rails	13.50 to 14.00
Cast iron carwheels ..	10.00 to 10.50
No. 1 machinery cast..	11.00 to 11.50
No. 1 railroad cast....	10.25 to 10.75
Burnt cast	7.25 to 7.75
Stove plates	7.25 to 7.75
Agricul. malleable	9.25 to 9.75
Railroad malleable	11.00 to 11.50

DETROIT

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. steel.	$9.50 to $10.00
No. 2 hvy. mltng. steel.	8.50 to 9.00
Borings and turnings.	5.50 to 6.00
Long turnings	5.50 to 6.00
Short shov. turnings..	6.00 to 6.50
No. 1 machinery cast..	14.50 to 15.00
Automotive cast .....$13.25 to $13.75	
Hydraul. comp. sheets	9.75 to 10.25
Stove plate	8.75 to 9.25
New factory bushel...	9.00 to 9.50
Old No. 2 busheling...	5.00 to 5.50
Sheet clippings	6.50 to 7.00
Flashings	8.50 to 9.00
Low phos. plate scrap	10.00 to 10.50

CANADA

Dealers' buying prices per gross ton:

	Toronto	Montreal
Hvy. melting steel.....	$7.50	$7.00
Rails, scrap	8.50	8.00
Machine shop turn.....	4.00	4.00
Boiler plate	7.00	6.00
Hvy. axle turnings.....	4.50	4.00
Cast borings	5.00	4.50
Steel borings	4.00	4.00
Wrought pipe	4.00	4.00
Steel axles	8.50	9.00
Axles, wrought iron....	9.00	9.50
No. 1 machinery cast..	11.50	11.00
Stove plate	7.50	7.00
Standard carwheels	11.00	10.50
Malleable	7.00	7.00
Shoveling steel	6.50	6.00
Bushelings	6.00	5.50
Compressed sheets	6.50	6.00

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$13.00 to $13.50
Hydraulic bundles	13.00 to 13.50
Machine shop turn....	9.00 to 9.50

NEW YORK

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. steel.	$8.75 to $9.25
No. 2 hvy. mltng. steel.	7.50 to 8.00
Hvy. breakable cast..	8.00 to 8.50
No. 1 machinery cast.	9.00 to 9.50
No. 2 cast	7.75 to 8.25
Stove plate	6.75 to 7.25
Steel car axles	13.00 to 13.50
Shafting	14.00 to 14.50
No. 1 RR. wrought....	9.00 to 9.50
No. 1 wrought long....	8.50 to 9.00
Spec. iron & steel pipe	8.50 to 9.00
Forge fire	7.50 to 8.00
Rails for rolling.....	10.50 to 11.00
Short shov. turnings..	5.00 to 5.50
Machine shop turn....	4.50 to 5.00
Cast borings	4.50 to 5.00
No. 1 blast furnace....	3.00 to 3.50
Cast borings (chem.)..	9.50 to 10.50
Unprepar. yard scrap.	5.00 to 5.50

Per gross ton, delivered local foundries:

No. 1 machin. cast....	.... $11.50
No. 1 hvy. cast cupola.	.... 9.50
No. 2 cast	.... 8.00

Add 50c. to 75c. to above quotations to secure North Jersey prices.

BOSTON

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. steel.	$7.50 to $7.90
Scrap rails	7.50 to 8.00
No. 2 steel	6.50 to 6.90
Breakable cast	7.00 to 7.25
Machine shop turn....	3.00 to 3.40
Bund. skeleton, long..	6.00 to 6.25
Shafting	13.00 to 13.50
Cast bor., chemical...	5.00 to 7.00
Cotton ties	5.75 to 6.00

Per gross ton delivered consumers' yards:

Textile cast .....$10.50 to $11.00	
No. 1 machin. cast....	10.50 to 11.00
Stove plate	.... 9.00

EXPORT

Brokers' buying prices per gross ton:

New York, delivered alongside barges	
No. 1 hvy. mltng. steel.	.... $9.50
No. 2 hvy. mltng. steel.	.... 8.50
No. 2 cast	$8.00 to 8.50
Stove plate	7.00 to 7.25
Rails (scrap)	10.50 to 11.00
Philadelphia, on cars at Port Richmond	
No. 1 heavy melting steel.....	$11.00
Boston, on cars at Army Base or Mystic Wharf	
No. 1 hvy. mltng. steel.	.... $10.50
No. 2 hvy. mltng. steel.	.... 9.50
Rails (scrap)	.... 10.50
Stove plate	.... 7.50
Machine shop turn ...	$4.75 to 5.00
New Orleans, on cars at Stuyvesant Dock	
No. 1 hvy. mltng. steel.	$10.00 to $10.50
No. 2 hvy. mltng. steel.	9.00 to 9.50
Los Angeles, on cars or trucks at local piers	
No. 1 hvy. mltng. steel.	$10.50 to $11.00
Compressed bundles ..	8.50 to 9.00

PRICES ON FINISHED AND SEMI-FINISHED IRON AND STEEL

SEMI-FINISHED STEEL

Billets, Blooms and Slabs

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham. Prices at Duluth are $2 a ton higher, and delivered Detroit $3 higher.

	Per Gross Ton
Rerolling	$28.00
Forging quality	35.00

Sheet Bars

F.o.b. Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

	Per Gross Ton
Open-hearth or Bessemer	$28.00

Skelp

F.o.b. Pittsburgh, Chicago, Youngstown, Buffalo, Coatesvile, Pa., Sparrows Point, Md.

	Per Lb.
Grooved, universal and sheared	1.80c.

Wire Rods
(Nos. 4 and 5)

	Per Gross Ton
F.o.b. Pittsburgh or Cleveland	$38.00
F.o.b. Chicago, Youngstown or Anderson, Ind.	39.00
F.o.b. Worcester, Mass.	40.00
F.o.b. Birmingham	41.00
F.o.b. San Francisco	47.00
F.o.b. Galveston	44.00

BARS, PLATES, SHAPES

Iron and Steel Bars

Soft Steel

	Base per Lb.
F.o.b. Pittsburgh	1.85c.
F.o.b. Chicago or Gary	1.90c.
F.o.b. Duluth	2.00c.
Del'd Detroit	2.00c.
F.o.b. Cleveland	1.90c.
F.o.b. Buffalo	1.95c.
Del'd Philadelphia	2.16c.
Del'd New York	2.20c.
F.o.b. Birmingham	2.00c.
F.o.b. cars dock Gulf ports	2.25c.
F.o.b. cars Pacific ports	2.40c.

Rail Steel
(For merchant trade)

F.o.b. Pittsburgh	1.70c.
F.o.b. Cleveland, Chicago, Gary or Moline, Ill.	1.75c.
F.o.b. Buffalo	1.80c.
F.o.b. Birmingham	1.85c.
F.o.b. cars dock Gulf ports	2.10c.
F.o.b. cars dock Pacific ports	2.25c.

Billet Steel Reinforcing
(Straight lengths as quoted by distributors)

F.o.b. Pittsburgh	2.05c.
F.o.b. Buffalo, Cleveland, Youngstown, Chicago, Gary or Birmingham	2.10c.
Del'd Detroit	2.20c.
F.o.b. cars dock Gulf ports	2.45c.
F.o.b. cars dock Pacific ports	2.45c.

Rail Steel Reinforcing
(Straight lengths as quoted by distributors)

F.o.b. Pittsburgh	1.90c.
F.o.b. Buffalo, Cleveland, Youngstown, Chicago, Gary or Birmingham	1.95c.
F.o.b. cars dock Gulf ports	2.30c.
F.o.b. cars dock Pacific ports	2.30c.

Iron

F.o.b. Chicago	1.80c.
F.o.b. Pittsburgh (refined)	2.10c.
Delivered New York	2.05c.
Delivered Philadelphia	2.10c.

Cold Finished Bars and Shafting*

	Base per Lb.
F.o.b. Pittsburgh	2.10c.
F.o.b. Cleveland, Chicago and Gary	2.15c.
F.o.b. Buffalo	2.20c.
Del'd Detroit	2.30c.
Del'd eastern Michigan	2.35c.

*In quantities of 10,000 to 19,999 lb.

Plates

	Base per Lb.
F.o.b. Pittsburgh	1.80c.
F.o.b. Chicago or Gary	1.85c.
Del'd Cleveland	1.995c.
F.o.b. Coatesville or Spar. Pt.	1.90c.
Del'd Philadelphia	1.99c.
Del'd New York	2.09c.
F.o.b. Birmingham	1.95c.
F.o.b. cars dock Gulf ports	2.20c.
F.o.b. cars dock Pacific ports	2.35c.
Wrought iron plates, f.o.b. Pittsburgh	3.20c.

Floor Plates

F.o.b. Pittsburgh	3.35c.
F.o.b. Chicago	3.40c.
F.o.b. Coatesville	3.45c.
F.o.b. cars dock Gulf ports	3.75c.
F.o.b. cars dock Pacific ports	3.90c.

Structural Shapes

	Base per Lb.
F.o.b. Pittsburgh	1.80c.
F.o.b. Chicago	1.85c.
Del'd Cleveland	1.995c.
F.o.b. Buffalo or Bethlehem	1.90c.
Del'd Philadelphia	2.015c.
Del'd New York	2.0625c.
F.o.b. Birmingham (standard)	1.95c.
F.o.b. cars dock Gulf ports	2.20c.
F.o.b. cars dock Pacific ports	2.35c.

Steel Sheet Piling

	Base per Lb.
F.o.b. Pittsburgh	2.15c.
F.o.b. Chicago or Buffalo	2.25c.
F.o.b. cars dock Gulf or Pacific Coast ports	2.60c.

RAILS AND TRACK SUPPLIES

F.o.b. Mill

Standard rails, heavier than 60 lb. per gross ton	$36.37½
Angle bars, per 100 lb.	2.55

F.o.b. Code Basing Points

Light rails (from billets) per gross ton	$35.00
Light rails (from rail steel) per gross ton	34.00

	Base per 100 Lb.
Spikes	2.60
Tie plates, steel	1.90
Tie plates, Pacific Coast ports	2.00
Track bolts, to steam railroads	3.60
Track bolts, to jobbers, all sizes (per 100 counts)	70 per cent off list

Basing points on light rails are Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Buffalo, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton Pa.; on spikes alone, Cleveland, Youngstown, Lebanon, Pa., Columbia, Pa., Richmond, Va.

SHEETS, STRIP, TIN PLATE, TERNE PLATE

Sheets

Hot Rolled

	Base per Lb.
No. 10, f.o.b. Pittsburgh	1.85c.
No. 10, f.o.b. Gary	1.95c.
No. 10, del'd Detroit	2.05c.
No. 10, del'd Philadelphia	2.16c.
No. 10, f.o.b. Birmingham	2.00c.
No. 10, f.o.b. cars dock Pacific ports	2.40c.
Hot-Rolled Annealed	
No. 24, f.o.b. Pittsburgh	2.40c.
No. 24, f.o.b. Gary	2.50c.
No. 24, del'd Detroit	2.45c. to 2.60c.
No. 24, del'd Philadelphia	2.71c.
No. 24, f.o.b. Birmingham	2.55c.
No. 24, f.o.b. cars dock Pacific ports	3.05c.
No. 24, wrought iron, Pittsburgh	4.30c.

Heavy Cold-Rolled

No. 10 gage, f.o.b. Pittsburgh	2.50c.
No. 10 gage, f.o.b. Gary	2.60c.
No. 10 gage, f.o.b. Detroit	2.70c.
No. 10 gage, del'd Philadelphia	2.81c.
No. 10 gage, f.o.b. Birmingham	2.65c.
No. 10 gage, f.o.b. cars dock Pacific ports	3.10c.

Light Cold-Rolled

No. 20 gage, f.o.b. Pittsburgh	2.95c.
No. 20 gage, f.o.b. Gary	3.05c.
No. 20 gage, del'd Detroit	3.15c.
No. 20 gage, del'd Philadelphia	3.26c.
No. 20 gage, f.o.b. Birmingham	3.10c.
No. 20 f.o.b. cars dock Pacific ports	3.50c.

Galvanized Sheets

No. 24 gage, f.o.b. Pittsburgh	3.10c.
No. 24, f.o.b. Gary	3.20c.
No. 24, del'd Philadelphia	3.41c.
No. 24, f.o.b. Birmingham	3.25c.
No. 24, f.o.b. cars dock Pacific ports	3.70c.
No. 24, wrought iron, Pittsburgh	4.95c.

Long Ternes

No. 24, unassorted 8-lb. coating f.o.b. Pittsburgh	3.40c.
F.o.b. Gary	3.50c.
F.o.b. cars dock Pacific ports	4.10c.

Vitreous Enameling Stock

No. 20, f.o.b. Pittsburgh	2.95c.
No. 20, f.o.b. Gary	3.05c.
No. 20, f.o.b. Birmingham	3.55c.
No. 20, f.o.b. cars dock Pacific ports	3.55c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	2.75c.
No. 28, Gary	2.85c.
No. 28, cars dock Pacific ports	3.35c.

Tin Plate

	Base per Box
Standard cokes, f.o.b. Pittsburgh district mill	$5.25
Standard cokes, f.o.b. Gary	5.35
Standard cokes, f.o.b. cars dock Pacific ports	5.90

Terne Plate

(F.o.b. Pittsburgh)

(Per Package, 20 x 28 in.)

8-lb. coating I.C.	$10.00
15-lb. coating I.C.	12.00
20-lb. coating I.C.	13.00
25-lb. coating I.C.	14.00
30-lb. coating I.C.	15.25
40-lb. coating I.C.	17.50

Hot-Rolled Hoops, Bands, Strips and Flats under ¼ In.

	Base per Lb.
All widths up to 24 in., P'gh.	1.85c.
All widths up to 24 in., Chicago	1.95c.
All widths up to 24 in., del'd Detroit	2.05c.
All widths up to 24 in., Birmingham	2.00c
Cooperage stock, Pittsburgh	1.95c.
Cooperage stock, Chicago	2.05c.

Cold-Rolled Strips*

	Base per Lb.
F.o.b. Pittsburgh	2.60c.
F.o.b. Cleveland	2.60c.
Del'd Chicago	2.895c.
F.o.b. Worcester	2.80c.

*Carbon 0.25 and less.

Fender Stock

No. 14, Pittsburgh or Cleveland	2.90c.
No. 14, Worcester	3.30c.
No. 20, Pittsburgh or Cleveland	3.30c.
No. 20, Worcester	3.70c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland.)

To Manufacturing Trade

	Per Lb.
Bright wire	2.40c.
Spring wire	3.05c.

Chicago prices on products sold to the manufacturing trade are $1 a ton above Pittsburgh or Cleveland. Worcester and Duluth prices are $2 a ton above, Birmingham $3 above, and Pacific Coast prices $9 a ton above Pittsburgh or Cleveland.

To the Trade

	Base per Keg
Standard wire nails	$2.10
Smooth coated nails	2.10

	Base per 100 Lb.
Annealed fence wire	$2.65
Galvanized fence wire	3.00
Polished staples	2.80
Galvanized staples	3.05
Barbed wire, galvanized	2.60
Twisted barbless wire	2.60
Woven wire fence, base column	58
Single loop bale ties, base column	51

Chicago and Anderson, Ind., mill prices are $1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is $2 above Pittsburgh); Duluth, Minn., mill prices are $2 a ton over Pittsburgh except for woven wire fence, which is $3 over Pittsburgh and Birmingham mill prices are $3 a ton over Pittsburgh.

On wire nails, barbed wire and staples, prices at Houston, Galveston and Corpus Christi, Tex., New Orleans, Lake Charles, La., and Mobile, Ala., are $6 a ton over Pittsburgh.

On nails, staples and barbed wire, prices of $6 a ton above Pittsburgh are also quoted at Beaumont and Orange, Tex.

STEEL AND WROUGHT IRON PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

F.o.b. Pittsburgh only on wrought iron pipe.

Butt Weld

Steel In.	Black	Galv.	*Wrought Iron* In.	Black	Galv.
⅛	.57	37	⅛	+91½	+138
¼ to ⅜	.60	44½	¼ & ⅜	+1½	+21½
½	.64½	55	½	31½	15
¾	.67½	59	¾	36½	20½
1 to 3	.69½	61½	1 & 1¼	.39½	25½
			1½	.43½	28
			2	.41½	26

Lap Weld

2	.62	53½	2	.37	22½
2½ to 3.65		56½	2½ to 3½	38	25
3½ to 6.67		58½	4 to 8	.40	28½
7 & 8.66		56½	9 to 12	.38	24½
9 & 10.65½		56			
11 & 12.64½		55			

Butt Weld, extra strong, plain ends

⅛	.55½	42½	⅛	+13	+45½
¼ to ⅜	.57½	46½	¼ & ⅜	+2½	+34½
½	.62½	54½	½	32½	17½
¾	.66½	58½	¾	37½	22½
1 to 3	.68	61	1 to 2	.43½	29

Lap Weld, extra strong, plain ends

2	.60	52½	2	.40	26
2½ to 3.64		56½	2½ to 4	45½	33
3½ to 6.67½		60	4½ to 6	45	33½
7 & 8.	.66½	57	7 & 8	.46	33
9 & 10.	.65½	56	9 to 12.41½		30
11 & 12.	.64½	55			

On butt-weld and lap-weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Seamless Steel Commercial Boiler Tubes and Locomotive Tubes

(Net base prices per 100 ft. f.o.b. Pittsburgh in carload lots)

		Cold Drawn	Hot Rolled
1 in. o.d.	13 B.W.G.	$ 8.60	$ 7.82
1¼ in. o.d.	13 B.W.G.	10.19	9.26
1½ in. o.d.	13 B.W.G.	11.26	10.23
1¾ in. o.d.	13 B.W.G.	12.81	11.64
2 in. o.d.	13 B.W.G.	14.35	13.04
2¼ in. o.d.	13 B.W.G.	16.00	14.54
2½ in. o.d.	12 B.W.G.	17.61	16.01
2¾ in. o.d.	12 B.W.G.	19.29	17.54
2¾ in. o.d.	12 B.W.G.	20.45	18.59
3 in. o.d.	12 B.W.G.	$21.45	$19.50
3½ in o.d.	10 B.W.G.	41.08	37.35
3½ in. o.d.	11 B.W.G.	27.09	24.62
4 in. o.d.	10 B.W.G.	33.60	30.54
4½ in. o.d.	10 B.W.G.	41.08	37.35
5 in. o.d.	9 B.W.G.	51.56	46.87
6 in. o.d.	7 B.W.G.	79.15	71.90

Extra for less-carload quantities:

25,000 lb. or ft. to 39,999 lb. or ft.	5	%
12,000 lb. or ft. to 24,999 lb. or ft.	12½	%
6,000 lb. or ft. to 11,999 lb. or ft.	25	%
2,000 lb. or ft. to 5,999 lb. or ft.	35	%
Under 2,000 lb. or ft.	50	%

CAST IRON WATER PIPE

Per Net Ton

*6-in. and larger, del'd Chicago.	$48.40
6-in. and larger, del'd New York	45.20
*6-in. and larger, Birmingham	40.00
6-in. and larger, f.o.b. dock, San Francisco or Los Angeles	48.00
F.o.b. dock, Seattle	48.50
F.o.b. dock, Seattle	51.50

Class "A" and gas pipe, $3 extra.
4-in. pipe is $3 a ton above 6-in.

* Prices for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is $39, Birmingham, and $47.40, delivered Chicago and 4-in. pipe, $42, Birmingham, and $50.40 a ton, delivered Chicago.

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Per Cent Off List

Machine and carriage bolts: ½ in. x 6 in. and smaller	70, 10 and 5 to 70 and 10
Larger than ½ in.	70 and 10 to 70 and 5
Lag bolts	70 and 10 to 70 and 5
Plow bolts, Nos. 1, 2, 3, and 7 heads	70 and 10 to 70 and 5
Hot-pressed nuts, blank or tapped, square	70 and 10 to 70 and 5
Hot-pressed nuts, blank or tapped, hexagon	70 and 10 to 70 and 5
C.p.c. and t. square or hex. nuts, blank or tapped	70 and 10 to 70 and 5
Semi-finished hexagon nuts, U.S.S. and S.A.E., all sizes	60, 20 and 15 to 60, 20 and 10
Stove bolts in packages, nuts attached	72½, 10 and 10 to 75
Stove bolts in packages, with nuts separate	72½, 10, 10 and 5 to 75 and 5
Stove bolts in bulk	82½
Tire bolts	55 to 50 and 5

On stove bolts freight is allowed to destination on 200 lb. and over.

Large Rivets

(½-in. and larger)

	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland	$2.90 to $3.05
F.o.b. Chicago or Birmingham	3.00 to 3.15

Small Rivets

(7/16-in. and smaller)

Per Cent Off List

F.o.b. Pittsburgh	70 and 5
F.o.b. Cleveland	70 and 5
F.o.b. Chicago and Birm'g'm.	70 and 5

Cap and Set Screws

(Freight allowed up to but not exceeding 65c. per 100 lbs. on lots of 200 lb. or more)

Per Cent Off List

Milled cap screws, 1 in. dia. and smaller	80, 10 and 10
Milled standard set screws, case hardened, 1 in. dia. and smaller	75
Milled headless set screws, cut thread ¾ in. and smaller	75
Upset hex. head cap screws U.S.S. or S.A.E. thread, 1 in and smaller	85
Upset set screws, cut and oval points	75 and 10
Milled studs	65 to 65 and 10

Alloy and Stainless Steel

Alloy Steel Blooms, Billets and Slabs

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem.
Base price, $49 a gross ton.

Alloy Steel Bars

F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.
Open-hearth grade, base ..... 2.45c.
Delivered price at Detroit is.... 2.60c.

S.A.E. Series Numbers	Alloy Differential per 100 lb.
2000 (½% Nickel)	$0.25
2100 (2½% Nickel)	0.95
2300 (3½% Nickel)	1.50
2500 (5% Nickel)	2.25
3100 Nickel Chromium	0.55
3200 Nickel Chromium	1.35
3300 Nickel Chromium	3.80
3400 Nickel Chromium	3.20
4100 Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600 Nickel Molybdenum (0.20 to 0.30) Molybdenum (1.50 to 2.00 Nickel)	1.05
5100 Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100 Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100 Chromium Spring Steel	base
6100 Chromium Vanadium Bar	1.10c.
6100 Chromium Vanadium Spring Steel	$0.70
Chromium Nickel Vanadium	1.40
Carbon Vanadium	0.85

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. The differential for cold-drawn bars ½c. per lb. higher with separate extras. Blooms, billets and slabs under 4x4 in. or equivalent are sold on the bar base. Slabs with a section area of 16 in. and 2½ in. thick or over take the billet base. Sections 4x4 in. to 10x10 in. or equivalent carry a gross ton price, which is the net price for bars for the same analysis. Larger sizes carry extras.

Alloy Cold-Finished Bars

F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 2.95c. base per lb.

STAINLESS STEEL No. 302

(17 to 19% Cr, 7 to 9% Ni, 0.08 to 0.20% C.)

(Base Prices f.o.b. Pittsburgh)

	Per Lb.
Forging billets	19.55c.
Bars	23c.
Plates	26c.
Structural shapes	23c.
Sheets	33c.
Hot-rolled strip	20¾c.
Cold-rolled strip	27c.
Drawn wire	23c.

TOOL STEEL

	Base per Lb.
High speed	55c.
High carbon chrome	35c.
Oil hardening	20c.
Extra	15c.
Regular	12c.

Prices for warehouse distribution to all points on or East of Mississippi River are 2c. a lb. higher. West of Mississippi quotations are 3c. a lb. higher.

British and Continental

BRITISH

Per Gross Ton
f.o.b. United Kingdom Ports

Based on exchange rate as of June 8

Ferromanganese, export	$45.00
Billets, open-hearth	29.37 to $30.62
Tin plate, per base box	4.68 to 4.78
Steel bars, open-hearth	39.37
Beams, open-hearth	38.12
Channels, open-hearth	39.37
Angles, open-hearth	38.12
Black sheets, No. 24 gage	48.75
Galvanized sheets, No. 24 gage	58.75

CONTINENTAL

Per Metric Ton, f.o.b. Continental Ports

Based on Exchange rate of June 8

Billets, Thomas	$19.27
Wire rods, No. 5 B.W.G.	36.90
Steel bars, merchant	26.64
Sheet bars	19.68
Plate, ¼ in. and up	35.42
Plate, 3/16 in. and 5 mm.	34.85
Sheets, ⅛ in.	36.90
Beams, Thomas	25.58
Angles (Basic)	25.58
Hoops and strip base	32.79
Wire, plain, No. 8	44.03
Wire nails	47.15
Wire, barbed, 4 pt. No. 10 B.W.G.	71.74

IRON AND STEEL WAREHOUSE PRICES

PITTSBURGH

Base per Lb.

Plates ..... 3.15c.
Structural shapes..... 3.15c.
Soft steel bars and small shapes 2.95c.
Reinforcing steel bars ..... 2.95c.
Cold-finished and screw stock:
Rounds and hexagons..... 3.35c.
Squares and flats..... 3.35c.
Hoops and bands under ¼ in.. 3.20c.
Hot-rolled annealed sheets (No. 24), 25 or more bundles..... 3.30c.
Galv. sheets (No 24), 25 or more bundles..... 3.95c.
Hot-rolled sheets (No. 10)..... 2.95c.
Galv. corrug. sheets (No. 28), per square (more than 3750 lb.) $3.69
Spikes, large ..... 3.10c.
Track bolts, all sizes, per 100 count .....65 per cent off list
Machine bolts, 100 count, 65 per cent off list
Carriage bolts, 100 count, 65 per cent off list
Nuts, all styles, 100 count, 65 per cent off list
Large rivets, base per 100 lb.. $3.80
Wire, black, soft ann'l'd, base per 100 lb. ..... 2.90c.
Wire, galv. soft, base per 100 lb. ..... 3.25c.
Common wire nails, per keg.. 2.35c.
Cement coated nails, per keg. 2.35c.

On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 9999 lb.

*Delivered in Pittsburgh switching district.

CHICAGO

Base per Lb.

Plates and structural shapes.. 3.20c.
Soft steel bars, rounds..... 3.00c.
Soft steel bars, squares and hexagons ..... 3.15c.
Cold-fin. steel bars:
Rounds and hexagons .... 3.50c.
Flats and squares..... 3.50c.
Hot-rolled strip..... 3.30c.
Hot-rolled annealed sheets (No. 24)..... 3.85c.
Galv. sheets (No. 24)..... 4.55c.
Hot-rolled sheets (No. 10).... 3.05c.
Spikes (keg lots)..... 3.50c.
Track bolts (keg lots)..... 4.65c.
Rivets, structural (keg lots)... 3.65c.
Rivets, boiler (keg lots)..... 3.75c.

Per Cent Off List

Machine bolts..... *70
Carriage bolts..... *70
Lag screws *70
Hot-pressed nuts, sq. tap or blank *70
Hot-pressed nuts, hex. tap or blank *70
Hex. head cap screws.....87½
Cut point set screws .....75 and 10
Flat head bright wood screws.. 70
Spring cotters..... 55
Stove bolts in full packages..... 70
Rd. hd. tank rivets, 7/16 in. and smaller.....57½
Wrought washers .....$4.50 off list
Black ann'l'd wire per 100 lb..$3.85
Com. wire nails, base per keg.. 2.95†
Cement c't'd nails, base per keg 2.95†

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 9999 lb. All prices are fo.b. consumers' plants within the Chicago switching district.

*These are quotations delivered to city trade for quantities of 100 lb. or more. For lots of less than 100 lb., the quotation is 65 per cent off. Discounts applying to country trade are 70 per cent off, f.o.b. Chicago, with full or partial freight allowed up to 50c. per 100 lb.

†Prices for city and suburbs only.

NEW YORK

Base per Lb.

Plates, ¼ in. and heavier.... 3.40c.
Structural shapes..... 3.37c.
Soft steel bars, rounds..... 3.31c.
Iron bars ..... 3.31c.
Iron bars, Swed. charcoal ..... 6.75c. to 7.00c.
Cold-fin. shafting and screw stock:
Rounds and hexagons..... 3.81c.
Flats and squares..... 3.81c.
Cold-rolled; strip, soft and quarter hard..... 3.36c.
Hoops ..... 3.56c.
Bands ..... 3.56c.
Hot-rolled sheets (No. 10).... 3.31c.
Hot-rolled ann'l'd sheets (No. 24*) ..... 3.89c.
Galvanized sheets (No. 24*)..Special
Long terne sheets (No. 24).... 5.25c.
Standard tool steel..... 11.00c.
Wire, black annealed (No. 10). 3.40c.
Wire, galv. (No. 10)..... 3.75c.
Tire steel, 1 x ½ in. and larger 3.75c.
Open-hearth spring steel ..... 4.00c. to 10.00c.
Common wire nails, base per keg $3.21

Per Cent Off List

Machine bolts, square head and nut:
All diameters .....65 and 10
Carriage bolts, cut thread:
All diameters.....65 and 10

Per 100 Ft.

Boiler tubes:
Lap welded, 2-in.....$18.05
Seamless welded, 2-in..... 19.24
Charcoal iron, 2-in..... 24.94
Charcoal iron, 4-in. 63.65

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

ST. LOUIS

Base per Lb.

Plates and struc. shapes..... 3.45c.
Bars, soft steel (rounds and flats) ..... 3.25c.
Bars, soft steel (squares, hexagons, ovals, half ovals and half rounds)..... 3.40c.
Cold-fin. rounds, shafting, screw stock..... 3.75c.
Hot-rolled annealed sheets (No. 24) ..... 4.10c.
Galv. sheets (No. 24)..... 4.65c.
Hot-rolled sheets (No. 10)..... 3.30c.
Black corrug. sheets (No. 24).. 4.10c.
*Galv. corrug. sheets..... 4.65c.
Structural rivets..... 4.00c.
Boiler rivets..... 4.10c.

Per Cent Off List

Tank rivets, 7/16 in. and smaller. 55
Machine and carriage bolts, lag screws, fitting up bolts, bolt ends, plow bolts, hot-pressed nuts, square and hexagon, tapped or blank, semi-finished nuts; all quantities..... 70

*No. 26 and lighter take special prices.

PHILADELPHIA

Base per Lb.

*Plates, ¼-in. and heavier.... 2.98c.
*Structural shapes..... 2.98c.
*Soft steel bars, small shapes, iron bars (except bands).... 3.03c.
‡Reinforc. steel bars, sq. twisted and deformed..... 2.96c.
Cold-finished steel bars..... 3.76c.
*Steel hoops ..... 3.43c.
*Steel bands, No. 12 and 3/16 in. incl. ..... 3.18c.
Spring steel ..... 5.00c.
†Hot-rolled anneal. sheets (No. 24) ..... 3.65c.
†Galvanized sheets (No. 24)... 4.40c.
*Hot-rolled annealed sheets (No. 10)..... 3.08c.
Diam. pat. floor plates, ¼ in.. 4.95c.
Swedish iron bars..... 6.25c.

These prices are subject to quantity differential except on reinforcing and Swedish iron bars.

*Base prices subject to deduction on orders aggregating 4000 lb. or over.

†For 25 bundles or over.

‡For less than 2000 lb.

CLEVELAND

Base per Lb.

Plates and struc. shapes..... 3.31c.
Soft steel bars..... 3.00c.
Reinforc. steel bars..... 2.10c.
†Cold-finished steel bars..... 3.50c.
Flat-rolled steel under ¼ in.. 3.36c.
Cold-finished strip.....†3.00c.
Hot-rolled annealed sheets (No. 24)..... 3.91c.
Galvanized sheets (No. 24).... 4.61c.
Hot-rolled sheets (No. 10).... 3.11c.
Hot-rolled 3/16 in. 24 to 48 in. wide sheets ..... 3.56c.
*Black ann'l'd wire, per 100 lb.$2.40
*No. 9 galv. wire, per 100 lb.... 2.75
*Com. wire nails, base per keg.. 2.35

†Outside delivery 10c. less.

*For 5000 lb. or less.

CINCINNATI

Base per Lb.

Plates and struc. shapes..... 3.42c.
Bars, rounds, flats and angles. 3.22c.
Other shapes..... 3.37c.
Rail steel reinforc. bars..... 3.25c.
Hoops and bands, 3/16 in. and lighter ..... 3.47c.
Cold-finished bars..... 3.72c.
Hot-rolled annealed sheets (No. 24)..... 4.02c.
Galv. sheets (No. 24) 500 lb. or less ..... 4.47c.
Galvanized sheets (No. 24) over 500 lb. ..... 4.07c.
Hot-rolled sheets (No. 10).... 3.22c.
Structural rivets..... 4.35c.
Small rivets.....55 per cent off list
No. 9 ann'l'd wire, per 100 lb. (1000 lb. or over).....$2.88
Com. wire nails, base per keg:
Any quantity less than carload.. 3.04
Cement c't'd nails, base 100-lb. keg 3.50
Chain. lin. per 100 lb..... 8.35

Net per 100 Ft.

Seamless steel boiler tubes, 2-in. $20.37
4-in. 48.14
Lap-welded steel boiler tubes, 2-in. 19.38
4-in. 45.32

BUFFALO

Base per Lb.

Plates ..... 3.38c.
Struc. shapes..... 3.25c.
Soft steel bars..... 3.05c.
Reinforcing bars..... 2.60c.
Cold-fin. flats and sq. ..... 3.55c.
Rounds and hex. ..... 3.55c.
Cold-rolled strip steel..... 3.19c.
Hot-rolled annealed sheets (No. 24) ..... 4.06c.
Heavy hot-rolled sheets (3/16 in., 24 to 48 in. wide)..... 3.43c.
Galv. sheets (No. 24) ..... 4.70c.
Bands ..... 3.43c.
Hoops ..... 3.43c.
Heavy hot-rolled sheets ..... 3.18c.
Com. wire nails, base per keg. $3.10
Black wire, base per 100 lb. (2500-lb. lots or under)..... 4.00
(Over 2500 lb.) 3.90

BOSTON

Base per Lb.

Beams, channels, angles, tees, zees ..... 3.54c.
H beams and shapes ..... 3.54c.
Plates — Sheared, tank, and univ. mill, ¼ in. thick and heavier ..... 3.56c.
Floor plates, diamond pattern. 5.36c.
Bar and bar shapes (mild steel) ..... 3.45c.
Bands 3/16 in. thick and No. 12 ga. incl. .....3.65c. to 4.65c.
Half rounds, half ovals, ovals and bevels ..... 4.70c.
Tire steel ..... 4.70c.
Cold-rolled strip steel .....3.245c.
Cold-finished rounds, squares and hexagons ..... 3.90c.
Cold-finished flats ..... 3.90c.
Blue annealed sheets, No. 10 ga. ..... 3.65c.
One pass cold-rolled sheets No. 24 ga. ..... 4.20c.
Galvanized steel sheets, No. 24 ga. ..... 4.00c.
Lead coated sheets, No. 24 ga. 5.85c.

Price delivered by truck in metropolitan Boston, subject to quantity differentials.

DETROIT

	Base per Lb.
Soft steel bars	3.09c.
Structural shapes	3.42c.
Plates	3.42c.
Floor plates	5.17c.
Hot-rolled annealed sheets (No. 24)	3.94c.
Hot-rolled sheets (No. 10)	3.14c.
Galvanized sheets (No. 24)**	4.72c.
Bands	3.39c.
Hoops	3.39c.
†Cold-finished bars	3.64c.
Cold-rolled strip	3.18c.
Hot-rolled alloy steel (S.A.E. 3100 Series)	5.29c.*
Bolts and nuts, in cases, 70 and 10 per cent off list	
Broken cases .....70 per cent off	

Prices delivered by truck in metropolitan Detroit, subject to quantity differentials.

*Price applies to 1,000 lb. and over.

†With reduction in chemical extras.

**0.25c. off list for 10 to 25 bundles; 0.50c. for 25 bundles and over, Detroit delivery only.

MILWAUKEE

	Base per Lb.
Plates and structural shapes	3.31c.
Soft steel bars, rounds up to 8 in., flats and fillet angles	3.11c.
Soft steel bars, squares and hexagons	3.26c.
Hot-rolled strip	3.41c.
Hot-rolled sheets (No. 10)	3.16c.
Hot-rolled annealed 3/16—24 in. to 48 in. wide incl.	3.41c.
Hot-rolled annealed sheets (No. 24)	3.96c.
Galvanized sheets (No. 20)	4.66c.
Cold-finished steel bars	3.61c.
Cold-rolled strip	3.33c.
Structural rivets (keg lots)	3.86c.
Boiler rivets, cone head (keg lots)	3.96c.
Track spikes (keg lots)	3.91c.
Track bolts (keg lots)	4.91c.
Black annealed wire	3.40c.
Com. wire nails	2.60c.
Cement coated nails	2.60c.

	Per Cent Off List
Machine bolts, carriage bolts and lag screws	70 to 75
Hot-pressed nuts, sq. and hex. tapped or blank (keg lots)	70

Prices given above are delivered Milwaukee.

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 9999 lb. On galvanized and No. 24 hot-rolled annealed sheets the prices given apply on orders of 400 to 1500 lb. On cold-finished bars the prices are for orders of 1000 lb. or more of a size.

ST. PAUL

	Base per Lb.
Mild steel bars, rounds	3.25c.
Structural shapes	3.45c.
Plates	3.45c.
Cold-finished bars	4.02c.
Bands and hoops	3.55c.
Hot-rolled annealed sheets, No. 24	3.90c.
Galvanized sheets, No. 24	4.50c.
Cold-rolled sheets, No. 20	4.95c.

On mild steel bars, shapes, plates and hoops and bands the base applies on 400 to 14,999 lb. On hot-rolled sheets, galvanized sheets and cold-rolled sheets base applies on 15,000 lb. and over. Base on cold-finished bars is 1000 lb. and over of a size.

BALTIMORE

	Base per Lb.
*Mild steel bars	3.00c.
**Reinforcing bars	2.85c.
*Structural shapes	3.00c.
†Plates	3.00c.
†Hot-rolled sheets, No. 10	3.10c.
‡Hot-rolled annealed sheets, No. 24	3.60c.
‡Galvanized sheets, No. 24	4.30c.
*Bands	3.20c.
*Hoops	3.45c.
§Cold-rolled rounds	3.73c.
§Cold-rolled squares, hex. and flats	3.73c.
Rivets	4.40c.
Bolts and nuts, per cent off list	60 and 10

*Quantity extras per size apply.

†Quantity extras per thickness apply. Hot-rolled quantity extras are: 2000 lb. and over, base: 1500 lb. to 1999 lb. add 15c. per 100 lb.; 1000 lb. to 1499 lb. add 30c.; 0 to 999 lb., add 50c.

‡25 bundles and over, base. For 1 to 9 bundles add 50c. per 100 lb.; for 10 to 24 bundles add 25c.

§Base for 1000 lb. and over. For 500 to 999 lb. add 25c. per 100 lb.; for 300 to 499 lb. add $1.00; for 0 to 299 lb. add $1.75; for combined order under 100 lb. add $3.00.

**For orders 4000 lb. to 9999 lb. Add 15c. per 100 lb. for orders 2000 to 3999 lb.; add 65c. for orders less than 2000 lb.

CHATTANOOGA

	Base per Lb.
Mild steel bars	3.36c.
Iron bars	3.36c.
Reinforcing bars	3.36c.
Structural shapes	3.56c.
Plates	3.56c.
Hot-rolled sheets, No. 10	3.36c.
Hot-rolled annealed sheets No. 24	4.16c.
Galvanized sheets, No. 24	4.86c.
Steel bands	3.61c.
Cold-finished bars	4.13c.

MEMPHIS

	Base per Lb.
Mild steel bars	3.47c.
Shapes, bar size	3.47c.
Iron bars	3.47c.
Structural shapes	3.67c.
Plates	3.67c.
Hot-rolled sheets, No. 10	3.47c.
Hot-rolled annealed sheets, No. 24	4.27c.
Galvanized sheets, No. 24	4.80c.
Steel bands	3.72c.
Cold-drawn rounds	3.89c.
Cold-drawn flats, squares, hexagons	5.89c.
Structural rivets	4.25c.
Bolts and nuts, per cent off list	70
Small rivets, per cent off list.	50

NEW ORLEANS

	Base per Lb.
Mild steel bars	3.35c.
Reinforcing bars	3.50c.
Structural shapes	3.55c.
Plates	3.55c.
Hot-rolled sheets, No. 10	3.55c.
Hot-rolled annealed sheets, No. 24	4.35c.
Galvanized sheets, No. 24	4.95c.
Steel bands	3.95c.
Cold-finished steel bars	4.30c.
Structural rivets	4.25c.
Boiler rivets	4.25c.
Common wire nails, base per keg	$2.65
Bolts and nuts, per cent off list	70

PACIFIC COAST

	Base per Lb. San Francisco	Los Angeles	Seattle
Plates, tank and U. M.	3.25c.	3.60c.	3.80c.
Shapes, standard	3.25c.	3.60c.	3.80c.
Soft steel bars	3.25c.	3.60c.	3.95c.
Reinforcing bars, f.o.b. cars dock Pacific ports	2.45c.	2.45c.	2.45c.
Hot-rolled annealed sheets (No. 24)	4.10c.	4.35c.	4.40c.
Hot-rolled sheets (No. 10)	3.35c.	3.70c.	3.75c.
Galv. sheets (No. 24 and lighter)	4.50c.	4.40c.	5.00c.
Galv. sheets (No. 22 and heavier)	5.00c.	4.60c.	5.00c.
Cold finished steel			
Rounds	5.80c.	5.85c.	6.00c.
Squares and hexagons.	7.05c.	7.10c.	7.25c.
Flats	7.55c.	7.60c.	8.25c.
Common wire nails—base per keg less carload	$2.90	$2.90	$2.90

All items subject to differentials for quantity.

REFRACTORIES PRICES

Fire Clay Brick

	Per 1000 f.o.b. Works
High-heat duty, Pennsylvania, Maryland, Kentucky, Missouri and Illinois	$45.00
High-heat duty, New Jersey	50.00
High-heat duty, Ohio	40.00
Intermediate, Pennsylvania, Maryland, Kentucky, Missouri and Illinois	40.00
Intermediate, New Jersey	43.00
Intermediate, Ohio	35.00
Ground fire clay, per ton	7.00

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$45.00
Chicago District	54.00
Birmingham	$48.00 to 50.00
Silica cement per net ton	8.00

Chrome Brick

	Per Net Ton
Standard f.o.b Baltimore, Plymouth Meeting and Chester	$45.00
Chemically bonded f.o.b. Baltimore, Plymouth Meeting and Chester, Pa.	45.00

Magnesite Brick

	Per Net Ton
Standard, f.o.b. Baltimore and Chester, Pa.	$65.00
Chemically bonded, f.o.b. Baltimore	55.00

Grain Magnesite

	Per Net Ton
Imported, f.o.b. Baltimore and Chester, Pa. (in sacks)	$45.00
Domestic, f.o.b. Baltimore and Chester, in sacks	40.00
Domestic, f.o.b. Chewelah, Wash.	22.00

RAW MATERIALS PRICES

PIG IRON

No. 2 Foundry

F.o.b. Everett, Mass.; Bethlehem, Birdsboro and Swedeland, Pa., and Sparrows Point, Md.	$20.50
Delivered Brooklyn	22.9289
Delivered Newark or Jersey City	21.9873
Delivered Philadelphia	21.3132
F.o.b. Neville Island, Sharpsville and Erie, Pa.; Buffalo; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill.	19.50
F.o.b. Jackson, Ohio	21.25
Delivered Cincinnati	20.5807
F.o.b. Duluth	20.00
F.o.b. Provo, Utah	17.50
Delivered San Francisco, Los Angeles or Seattle	22.315
F.o.b. Birmingham*	15.50

* Delivered prices on southern iron for shipment to northern points are 38c. a ton below delivered prices from nearest northern basing point.

Malleable

Base prices on malleable iron are 50c. a ton above No. 2 foundry quotations at Everett, Eastern Pennsylvania furnaces, Erie and Buffalo. Elsewhere they are the same.

Basic

F.o.b. Everett, Mass.; Bethlehem, Birdsboro, Swedeland and Steelton, Pa., and Sparrows Point, Md.	$20.00
Delivered Boston Switching District	20.50
Delivered Newark or Jersey City	21.4873
Delivered Philadelphia	20.8132
F.o.b. Buffalo	18.50
F.o.b. Neville Island, Sharpsville and Erie, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill.	19.00
Delivered Cincinnati	20.0807
Delivered Canton, Ohio	20.3482
Delivered Mansfield, Ohio	20.8832
F.o.b. Jackson, Ohio	20.75
F.o.b. Provo, Utah	17.00
F.o.b. Birmingham	14.50

Bessemer

F.o.b. Everett, Mass.; Bethlehem, Birdsboro and Swedeland, Pa.	$21.50
Delivered Boston Switching District	22.00
Delivered Newark or Jersey City	22.9873
Delivered Philadelphia	22.3132
F.o.b. Buffalo and Erie, Pa., and Duluth	20.50
F.o.b. Neville Island and Sharpsville, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Birmingham	20.00
Delivered Cincinnati	21.0807
Delivered Canton, Ohio	21.3482
Delivered Mansfield, Ohio	21.8832

Low Phosphorus

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.	$24.00

Gray Forge

Valley or Pittsburgh furnace	$19.00

Charcoal

Lake Superior furnace	$22.00
Delivered Chicago	25.2528

Canadian Pig Iron

Per Gross Ton

Delivered Toronto.

No. 1 fdy., sil. 2.25 to 2.75	$21.00
No. 2 fdy., sil. 1.75 to 2.75	20.50
Malleable	22.50

Delivered Montreal

No. 1 fdy., sil. 2.25 to 2.75	$22.50
No. 2 fdy., sil. 1.75 to 2.25	22.00
Malleable	22.50
Basic	22.00

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.

Per Gross Ton

Domestic, 80% (carload)	$75.00

Spiegeleisen

Per Gross Ton Furnace

Domestic, 19 to 21%	$26.00
50-ton lots 3-mo. shipment	24.00
F.o.b. New Orleans	26.00

Electric Ferrosilicon

Per Gross Ton Delivered

50% (carloads)	$77.50
50% (ton lots)	85.00
75% (carloads)	126.00
75% (ton lots)	130.00

Silvery Iron

Per Gross Ton

F.o.b. Jackson, Ohio, 6.00 to 6.50%	$22.75

For each additional 0.5% silicon up to 12%, 50c. a ton is added.

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Manganese 2 to 3%, $1 a ton additional. For each unit of manganese over 3%, $1 a ton additional. Phosphorus 0.75% or over, $1 a ton additional.

Bessemer Ferrosilicon

F.o.b. Jackson, Ohio, Furnace

Per Gross Ton		*Per Gross Ton*	
10.00 to 10.50%	$27.75	13%	$31.75
10.51 to 11.00%	28.25	14%	33.25
11.00 to 11.50%	28.75	15%	34.75
11.51 to 12.00%	29.25	16%	36.25
12%	30.25	17%	37.75

Manganese 2 to 3%, $1 a ton additional. For each unit of manganese over 3%, $1 a ton additional. Phosphorus 0.75% or over, $1 a ton additional.

Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Other Ferroalloys

Ferrotungsten, per lb. contained W del., carloads	$1.30
Ferrotungsten, lots of 5000 lb.	1.35
Ferrotungsten, smaller lots	1.40
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr per lb. contained Cr delivered, in carloads, and contract	10.00c.
Ferrochromium, 2% carbon	16.50c. to 17.00c.
Ferrochromium, 1% carbon	17.50c. to 18.00c.
Ferrochromium, 0.10% carbon	19.50c. to 20.00c.
Ferrochromium, 0.06% carbon	20.00c. to 20.50c.
Ferrovanadium, del. per lb. contained V.	$2.70 to $2.90
Ferrocolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y.	$2.50
Ferrocarbontitanium, 15 to 18% Ti, 7 to 8% C, f.o.b. furnace carload and contract per net ton	$137.50
Ferrocarbontitanium, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract, per net ton	142.50
Ferrophosphorus, electric, or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18%, with $3 unitage, freight equalized with Rockdale, Tenn., per gross ton	58.50
Ferrophosphorus, electric, 24%, in carlots, f.o.b. Anniston, Ala., per gross ton with $3 unitage, freight equalized with Nashville, Tenn.	75.00
Ferromolybdenum, per lb. Mo del.	95c.
Calcium molybdate, per lb. Mo del.	80c.
Silico spiegel, per ton, f.o.b. furnace, carloads	$38.00
Ton lots or less, per ton	45.50
Silico-manganese, gross ton, delivered.	
2.50% carbon grade	85.00
2% carbon grade	90.00
1% carbon grade	100.00
Spot prices	$5 a ton higher

ORES

Lake Superior Ores

Delivered Lower Lake Ports

Per Gross Ton

Old range, Bessemer, 51.50%	$4.80
Old range, non-Bessemer, 51.50%	4.65
Mesabi, Bessemer, 51.50%	4.65
Mesabi, non-Bessemer, 51.50%	4.50
High phosphorus, 51.50%	4.40

Foreign Ore

C.i.f. Philadelphia or Baltimore

Per Unit

Iron, low phos., copper free, 55 to 58% dry Spain or Algeria	10.25c.
Iron, low phos., Swedish, average, 68½% iron	10.25c.
Iron, basic or foundry, Swedish, aver. 65% iron	9.50c.
Iron, basic or foundry, Russian, aver. 65% iron	Nominal
Man., Caucasian, washed 52%.	26c.
Man., African, Indian, 44-48%.	25c.
Man., African, Indian, 49-51%.	26c.
Man., Brazilian, 46 to 48½%.	24c.

Per Net Ton Unit

Tungsten, Chinese, wolframite, duty paid, delivered, nominal.	16.00
Tungsten, domestic, scheelite delivered, nominal	16.00

Per Gross Ton

Chrome, 45% Cr_2O_3, lump, c.i.f. Atlantic Seaboard (African).	$17.50
45 to 46% Cr_2O_3 (Turkish)	$16.50 to 17.00
48% Cr_2O_3 (African)	20.50
48% min. Cr_2O_3 (Turkish)	19.25
Chrome concentrate, 50% and over Cr_2O_3, c.i.f. Atlantic ports	22.00
52% Cr_2O_3 (Turkish)	21.75
48 to 49% Cr_2O_3 (Turkish)	19.25

FLUORSPAR

Per Net Ton

Domestic, washed gravel, 85-5, f.o.b. Kentucky and Illinois mines, all rail	$18.00
Domestic, barge and rail	19.00
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines	20.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid	21.50
Domestic No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines	35.00

FUEL OIL

Per Gal.

F.o.b. Bayonne or Baltimore, No. 3 distillate	4.25c.
F.o.b. Bayonne or Baltimore, No. 4 industrial	3.75c.
Del'd Ch'go, No. 3 industrial	5.00c.
Del'd Ch'go, No. 5 industrial	3.77c.
F.o.b. Cleveland, No. 3 distillate	6.00c.
F.o.b. Cleveland, No. 5 industrial	5.00c.

COKE AND COAL

Coke

Per Net Ton

Furnace, f.o.b. Connellsville Prompt	$3.65 to $3.80
Foundry, f.o.b. Connellsville Prompt	4.25 to 5.75
Foundry, by-product, Chicago ovens	9.00
Foundry, by-product, del'd New England	11.50
Foundry, by-product, del'd Newark or Jersey City	9.65
Foundry, by-product, Philadelphia	9.38
Foundry, by-product, delivered Cleveland	9.75
Foundry, by-product, delivered Cincinnati	9.50
Foundry, Birmingham	6.50
Foundry, by-product, St. Louis, f.o.b. ovens	8.00
Foundry, from Birmingham, f.o.b. cars docks, Pacific ports	14.75

Coal

Per Net Ton

Mine run steam coal, f.o.b. W. Pa. mines	$1.50 to $1.75
Mine run coking coal, f.o.b. W. Pa.	1.90 to 2.10
Gas coal, ¾-in. f.o.b. Pa. mines	2.00 to 2.25
Mine run gas coal, f.o.b. Pa. mines	1.80 to 2.00
Steam slack, f.o.b. W. Pa. mines	1.00 to 1.25
Gas slack, f.o.b. W. Pa. mines	1.20 to 1.45

. . . Philadelphia and Chicago have active week.

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. . . Summer slump not yet indicated in wide areas.

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. . . Delayed deliveries may result in postponed announcements of automotive innovations.

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By L. M. WAITE

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BASED upon definite reports from wide areas, machine tool builders still appear to be in for a busy summer in attempts to overcome an order backlog. A steady flow of replacement orders just about absorbs any week-to-week gain on the backlog, while rather regular so-called program orders, though lessened in numbers, add to assurances of machine-tool employment for some time to come. In distribution, sales representatives still insist that the weeks are too short to provide any degree of comfort in properly following up inquiries of the active sort.

Philadelphia

Philadelphia, including its normally assigned part of New Jersey, had a good week. Steel plant order probabilities, referred to several times recently, reached the closing stage and both Bethlehem Steel Co., at Bethlehem, Pa., and Midvale Co., at Philadelphia, ordered a considerable variety of tools. Competition was keen and the division of orders has given prolonged employment assurance in a number of machine tool localities.

Chicago

Inquiry and sales are actively upward. Program orders are still held back. Railroads are freer in making commitments for needs. Old time list proportions have not been reached, but are in the making. The Burlington is closing a few items and the Santa Fe urgently needs several tools on which it will close soon. Dealers expect the Rock Island list immediately. Agricultural implements lead the buying procession; business machine manufacturers have taken position well up in front. A Mid-Western manufacturer of turret lathes reports some good Eastern business. Prevailing opinion holds to steady volume during the summer months.

Detroit

Extended machine tool deliveries may require that certain car innovations which have been planned for November announcement shall be postponed until later in the year. Mechanical changes in many instances hinge upon machine tool deliveries. This situation is now so clearly evident that, in all likelihood, there will be a call for action on proposals covering new equipments to be purchased for 1938 models. Dealers are hard driven as intermediaries on delivery matters although some headway against delivery backlog is reported.

Cleveland

The week's orders are from automotive, stove, refrigerator, motor and aluminum-ware industries primarily; units range from single machines to lots of 12. Some Navy Yard orders were entered. Press orders were heavy with good volume of additional inquiries. One maker reports a 40 per cent increase in orders from the Cleveland-Detroit area, over January-June, 1935, period. Inquiry for planers took a spurt. Turret lathes show a slight tapering from May totals as entered by one builder.

Cincinnati

The week's business featured less orders of the hurry-up variety; lengthened anticipation of requirements is thereby noticeable. Opinion is expressed that political interest of the week was back of a slight lull in machine tool pressure. Light tools were the least affected. There was little easing of miller and grinder demand. Contract planer work is reported in sustained volume.

Pittsburgh

Equipment orders for the steel industry are being supplemented by a very satisfactory volume of single tool orders. Car builders are still a well-followed possibility. The active proposal list is said to be large, with pressure being brought to bear against delays in final decisions. Small tools and supplementary equipment are looked to as a source of considerable summer volume.

Metropolitan

It is regarded as probable that summer reports for this territory will average satisfactory volumes. Dealer reports will alternate between good and slow, it is indicated by earnestness of buyer interest in outstanding quotations. Several of the larger buyers will be regularly in the market, availing themselves of any opportunity to pick up preferred deliveries.

Eastern

Dealers operating in territories including Erie, Buffalo, Syracuse, Rochester, Binghamton and central New York points, both north and south, and in the greater part of New England, report themselves as enjoying a satisfactory amount of business thus far in June. Inquiries are continuing in a volume which requires the devoting of all spare time to study of customer requirements and maker suggestions and proposals; normal hours of sales activity are still required for shop discussions of proposals with actively interested shop heads.

Boston

Recent orders for standard equipment have been determined on the basis of machine types already in operation. Hesitancy because of political uncertainty shows little effect upon single tool orders of a replacement nature. Inquiry interest in large types of machines continues with probability of considerable fall volume predicted in some quarters.

Modeling in the Foundry

(CONTINUED FROM PAGE 29)

easily and does not require a special laboratory.

More reliance on such inspection by the commercial jobbing foundry is really an economic measure, inherently profitable to the manufacturer and a reliable assurance of improved and maintained quality to the trade. The fact that a foundry can offer radiographed castings has been proved to bear a tremendous sales argument which generally breaks down undue resistance in the minds of doubtful customers. Every day those foundries which can supply such service find their position enhanced. For there has been and still is a rapid development of steam installations of high pressure and temperature, high-pressure hydraulic power, high-pressure and high-temperature oil cracking systems, critical equipment in air transport, etc. All of these demand castings which will be reliable, and only through radiographic inspection can this reliability be assured.

X-Ray Sensitivity

All the radiographs of to-scale castings reproduced herein were made with the 400-kv. X-ray installation at the Chicago Heights, Ill., plant of American Manganese Steel Co. Tubes such as the one used in this equipment have been made for only about one year by General Electric X-Ray Corp., and the Amsco installation is the most powerful in industrial service.

Sensitivity tests with this tube have been made, and they are of such interest as to warrant inclusion in this article. Heretofore, it had been generally conceded that steel sections 3 in. thick or more were in the realm of gamma-ray investigation rather than X-ray. The belief was that X-ray prints of such thick sections would be blurred by internal scattered radiation and would be of little use in showing up small internal defects.

Sensitivity tests with the 400-kv. tube have, however, belied this contention to some extent and validate a statement made by the author in THE IRON AGE, Jan. 11, 1934. In making these tests, Amsco cast a group of manganese steel plates (1.15 per cent C, 12.50 Mn) to dimensions of 6 x 6 x 1 in. and then ground them flat. A series of ¼-in. slots were machined on the surface of one plate to depths of 0.025 in., 0.050 in., 0.1 in., 0.2 in., and 0.3 in. Exposures were made with total plate thicknesses (by stacking one plate on another) ranging from 1 in. to 4 in. The film was inclosed in lead filter cassettes. For thickness of 1 in., the 0.025-in. slot was clearly visible (see Fig. 6), and thus the definition was 2.5 per cent of the thickness. The film distance was 36 in., Kv. Peak equaled 190, current drawn was 5 milliamperes, and the exposure lasted 300 sec.

For a total plate thickness of 4 in., the 0.1-in. slot was clearly visible on the original print and thus the definition of this thickness also is 2.5 per cent. The film distance was 36 in., 3125 sec. was required for exposure, current equaled 5 milliamperes and Kv.P. was 400.

Therefore, for a casting thickness of 4 in., the Amsco equipment will reveal a minimum defect of 0.1 in. In a 1-in. section, a hair crack 0.025 in. wide will show up on the plate.

A good X-ray plate, however, must not only reveal a defect but must also show the defect clearly or with good definition in order that a radiographer may form some estimate regarding its size and location. Many factors influence the definition of a defect on an X-ray film, and a general review of whole technique was published by the author in THE IRON AGE, May 24, 1934.

The Amsco 400-kv. tube not only reveals small defects in thick sections, but definitions of the defects are about as good as could be desired. Generally speaking, sharpness or definition are dependent on two conditions, namely, the area of the focal spot on the X-ray tube target, and the distance between tube and film. The 36-in. distance used in both these expo-

Casting Data and Radiographic Results for Six To-Scale Pilot Castings
(Gate in Each Case is at 180°)

Casting Number	Down Gate		Gate Sprues			Bobs		Heads			Chills				Casting		Weights			Remarks		
	No.	Size	No.	Size	Location 30° 90°	No.	Size	No.	Size	Location	Size	No.	Location	Space	Position	Angle	Gross	Net	Yield	Shrinkage	Location 60° to 90°,	Figure
3	1	1 in. round	6	1 x 1 in.	150°, 210° 270°, 330°			6	3¼ in. round x 5 in.	30°, 90° 150°, 210° 270°, 330°					Small Dia. Up	Flat	105.0	40.5	38.5%	Medium	120° to 150°, 165° to 195°, 270° to 300°, 210° to 240°	Fig. 2
2	1	1 in. round	2	1 x 1 in.	150°, 210°	2	1½ in. round x 3 in.	2	3¼ in. round x 5 in.	330°, 30°					Small Dia. Up	25°	72.0	41.0	54.6%	Heavy	340° to 20°, 60° to 150°, 210° to 300°	Fig. 4
14	1	1 in. round	2	1 x 1 in.	150°, 210°			1	3¼ in. round x 5 in.	0°	⅝ in. x 1 in. x 4 in.	13	45° to 315°	20°	Small Dia. Up	25°	56.5	40.0	70.7%	Light	120° to 180°, 180° to 240°	Fig. 3
6	1	1 in. round	2	1 x 1 in.	150°, 210°	2	2½ in. round x 3 in.	1	3¼ in. round x 5 in.	0°	⅝ in. x 1 in. x 4 in.	13	45° to 315°	20°	Small Dia. Up	25°	67.0	40.0	59.7%	None		
15	1	1 in. round	2	1 x 1 in.	150°, 210°	2	2½ in. round x 3 in.	1	3¼ in. round x 5 in.	0°	⅝ in. x 1 in. x 4 in.	13	45° to 315°	20°	Small Dia. Down	25°	76.8	40.0	52.2%	Very Light	30° to 60°	
13	1	1 in. round	1	1 x 1 in.	0°			1	3¼ in. round x 5 in.	180°					Small Dia. Up	+10° −10°	51.5	40.0	77.6%	None		Fig. 5

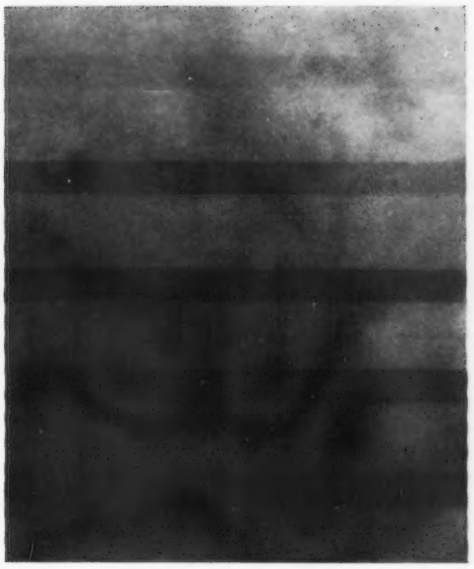


FIG. 6—Definition of 2.5 per cent in a total thickness of 1 in. of manganese steel. Equal definition is possible with a 4-in. plate. The heaviest line is a slot 0.3 in. deep, the next slot is 0.2 in. deep, and the other slots in this experimental penetrometer are 0.1 in., 0.05 in., and 0.025 in. respectively. Note that the 0.025-in. slot is easily discernible.

sures is about the maximum generally used; for greater distances require excessively long exposures. The sharpness of the Amsco prints, therefore, can be attributed both to the long tube film distance as well as to the use of a powerful tube of such advanced design that the focal point is not excessively large.

Coloring of Metal

(CONTINUED FROM PAGE 33)

film on the chromium alloy surface. Chromium, when alloyed with nickel and iron to give the familiar stainless steel, is, of course, one of our most important metals with a durable silver gray finish. This alloy is usually 18 per cent chromium, 8 per cent nickel and 74 per cent iron.

The so-called chromium plate offered by street merchants is actually nothing more than mercury produced from mercurous chloride which adheres quickly and easily with the usual characteristics of this metal but which tarnishes in from 5 to 6 hr.

Rhodium is coming into prominence because of its fine grain structure and high reflectivity, both of which features are described elsewhere in connection with rhodium plating.

Rhodium itself is seldom colored and there is no record of investigation in this field.

Lead, Platinum and Silver

Lead is an excellent metal when properly alloyed, but for some reason its value is not fully appreciated. Years ago pewter, which is an alloy of 80 per cent lead and about 20 per cent tin, was one of the valuable household metals.

Lead when used with other metals forms a low-temperature melting alloy which is used for making slush castings, the application of which is chiefly for lighting fixtures. These are hollow castings made by pouring the molten alloy into a metal form and allowing it to solidify against the sides. The parts thus made are easily nickel plated. However, care should be taken not to brass plate them first, as the brass coating is absorbed by the alloy and disappears.

Lead coated copper has achieved considerable importance in the building industry for roofs and marquees and ornamental work. "The lead surface," states the Copper and Brass Research Association, "affords a wide variety of tones and finishes, from the metallic gray of newly cast metal to the soft weathered antiques, and from smooth surfaces to those that are extremely rough."

Silver may be easily colored, but where a color differing from the characteristic features of silver is desired, the general practice is to use a less expensive metal. German silver, which is an alloy containing 70 per cent copper and 30 per cent nickel, is used as a base for chromium plated flatware and hollow ware. Other base metals in this field are brass, copper and pewter. A good practice in production of silver plated flatware is to use German silver as the base and then apply a flash copper coating, then a nickel plate, then a flash of silver, and finally the full silver plate. Silver plated ware is often dipped in potassium sulphide solution to produce a silica sulphide film which gives the ware pleasing shades from dark brown to black.

Platinum has quite a wide use in the jewelry industry and may be colored by alloying to give effects ranging from a silver white to white gold. Coloring by chemical means is possible but not extensively used.

Rhenium is an interesting silver white metal discovered by Ida and Walter Nodack of Germany in 1925. Apparently it has been ignored until recently in this country, but now several investigators, including one of the present authors, Doctor Young, are working on the use of rhenium plate on steel and copper. Its chief value is the fact that it is insoluble in hydrochloric acid.

Magnesium alloys, of which the usual form is known as Dowmetal, may be colored much the same as aluminum and also may be colored by alloying. Magnesium silicon alloys and magnesium aluminum silicon alloys are frequently used.

Canadian Steel Output Higher than Year Ago

PRODUCTION of pig iron in Canada up to April 30 totaled 225,000 long tons, compared with 169,000 tons in 1935. An even greater gain occurred in steel, as output totaled 401,000 tons against 243,000 tons. Operations of the steel plant at Sydney reached 100 per eent of capacity in April for the first time since 1918.

PLANT EXPANSION AND EQUIPMENT BUYING

. . . International Nickel Co., New York, has approved plans for improvements in its refinery and additional units at Port Colborne, Ont., at a cost of $2,000,000.

o o o

. . . Magnolia Petroleum Co., Dallas, Tex., will expend $1,000,000 for additions and improvements to its oil refinery at Beaumont, Tex.

o o o

. . . Packard Electric Corp., Warren, Ohio, is taking bids for an addition to cost $175,000 with equipment.

NORTH ATLANTIC

International Nickel Co., 67 Wall Street, New York, has approved plans for several new units and installation of equipment at electrolytic nickel refining plant at Port Colborne, Ont. Improvements will be made also in present plant. Work is scheduled for completion by close of year. Cost over $2,000,000. Company has authorized immediate rebuilding of plant of Whitehead Metal Products, Ltd., Port Colborne, a subsidiary, recently destroyed by fire. Loss over $50,000 with equipment. Last noted plant was built about six months ago to specialize in production of monel metal boilers, heaters and kindred fabricated equipment.

Sylvania Industrial Corp., 122 East Forty-second Street, New York, manufacturer of transparent cellulose paper products, has let general contract to Hughes-Foulkrod Co., Schaff Building, Philadelphia, for one-story addition to plant at Fredericksburg, Va. Cost over $80,000 with equipment. Ballinger Co., 105 South Twelfth Street, Philadelphia, is architect and engineer.

Signal Corps Procurement District, Army Base, Fifty-eighth Street and First Avenue, Brooklyn, asks bids until June 26 for reel units in lots of 300 to 600 (Circular 249).

Construction Quartermaster, United States Military Academy, West Point, N. Y., has rejected bids recently received for extensions and improvements in power house, including installation of high-pressure steam boilers and other equipment, and will ask new bids soon. Cost about $150,000.

John Morrell & Co., 653 Brook Avenue, New York, meat packers, have let general contract to Turner Construction Co., 420 Lexington Avenue, for new four-story plant, 50 x 103 ft., at 446-48 West Fourteenth Street. Cost about $100,000 with equipment, including cold storage and refrigerating machinery. H. Peter Henschien, 59 East Van Buren Street, Chicago, is architect and engineer. Company headquarters are at Ottumwa, Iowa.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until June 23 for 290,000 lb. steel rivets, and 17,000 lb. steel tap rivets (Schedule 8161), one motor-generator set and three sets brushes (Schedule 8126), pumping units, including emergency feed pumps, make-up feed pumps, fire pumps and bilge pumps, with spare parts and tools (Schedule 8152); until June 26, steam and water drums and headers for boilers (Schedule 8163), one motor-driven turret lathe (Schedule 8171) for Brooklyn Navy Yard; electric cable (Schedule 8160), aluminum-alloy safety treads (Schedule 8196), bearings for airplane crane king post (Schedule 8158) for Brooklyn and Philadelphia yards.

United States Smelting, Refining & Mining Co., 57 William Street, New York, has leased copper ore properties of Bingham Metals Co., near Salt Lake City, Utah, and plans installation of equipment for development and operation, including drilling equipment, haulage and hoisting facilities, etc.

Kingsland Cooperage Co., Inc., 649 North Third Street, Newark, N. J., has acquired large part of former plant of Martin Everett Co., 273-301 Emmett Street, comprising 5-acre tract, with main one-story building, 100 x 325 ft., with machine shop, power house and smaller structures, and will remodel, primarily for production of steel drums, steel barrels, tanks, etc. Present works will be continued as heretofore.

Clem Co., Inc., 62 East Bigelow Street, Newark, manufacturer of special lighting fixtures and equipment, has leased building at 276 Jelliff Avenue, 40,000 sq. ft., floor space, for new plant to increase present capacity.

Signal Property Officer, Signal Corps Laboratory, Fort Monmouth, Oceanport, N. J., asks bids until June 25 for steel storage equipment (Circular 32).

Trenton Malleable Iron Co., New York and Ferrier Avenues, Trenton, N. J., bankrupt, complete equipment and assets have been purchased by S. L. Weiswasser, Philadelphia, and associates, who will take immediate possession. F. Robert Lee, vice-president and general manager, has been acting as trustee.

Bureau of Supplies and Accounts, Navy Department, Washington, ask bids until June 26 for one motor-driven heavy-duty vertical boring and turning machine for Philadelphia Navy Yard (Schedule 8169).

Atlantic Refining Co., 260 South Broad Street, Philadelphia, has authorized larger oil refinery on Neches River, Atreco, near Port Arthur, Tex., than that originally projected and on which superstructure is now beginning. Plant will cost about $5,000,000 with equipment, instead of one-half that sum, as previously announced.

Commanding Officer, Ordnance Department, Frankford Arsenal, Philadelphia, asks bids until June 22 for rebuilding three revolving heads for automatic screw machines, with installation of new roller bearings, etc. (Circular 526).

NEW ENGLAND

National Can Co., 71 Locust Street, Boston, plans extensions and improvements in factory, including equipment. Cost close to $45,000 with machinery. Main offices are at 110 East Forty-second Street, New York.

Commanding Officer, Ordnance Department, Springfield Armory, Springfield, Mass., asks bids until June 22 for six bench grinders (Circular 243).

Hygrade Sylvania Corp., Boston and Bridge Streets, Salem, Mass., manufacturer of radio tubes, incandescent lamps, etc., has acquired Economic Lamp Co., Malden, Mass., manufacturer of similar products, and will consolidate, concentrating production at Salem in future. Company has work under way on new three-story plant at South Salem, primarily for radio tube production. Cost over $250,000 with equipment. Lockwood Greene Engineers, Inc., 40 Central Street, Boston, is architect and engineer. Walter E. Poor is vice-president in charge of engineering and production.

Pond's Extract Co., Clinton, Conn., has let general contract to Aberthaw Co., 80 Federal Street, Boston, for three-story addition, 80 x 215 ft. Cost close to $125,000 with equipment. Offices of company are at 60 Hudson Street, New York.

Britt Brothers, Inc., Lynn, Mass., operating a boat-building and repair works, plans rebuilding part of plant recently destroyed by fire. Loss close to $100,000 with equipment.

BUFFALO DISTRICT

Oneida Community, Ltd., Sherrill, N. Y., manufacturer of silverware, animal traps, etc., has plans for two-story addition, 50 x 240 ft., primarily for storage and distribution. Cost close to $60,000 with equipment. E. D. Pitt, Kenwood, N. Y., is architect.

Gilbert Klinck Brewing Corp., Buffalo, recently organized, has work under way on new brewery on West Bennett Street. Cost over $85,000 with equipment.

Binghamton Foundry & Machine Co., Floral Avenue, Binghamton, N. Y., has let contract to Concrete Steel Co., 207 James Street, Syracuse, N. Y., for one-story steel fabricating unit, 75 x 200 ft. Cost close to $80,000 with machinery.

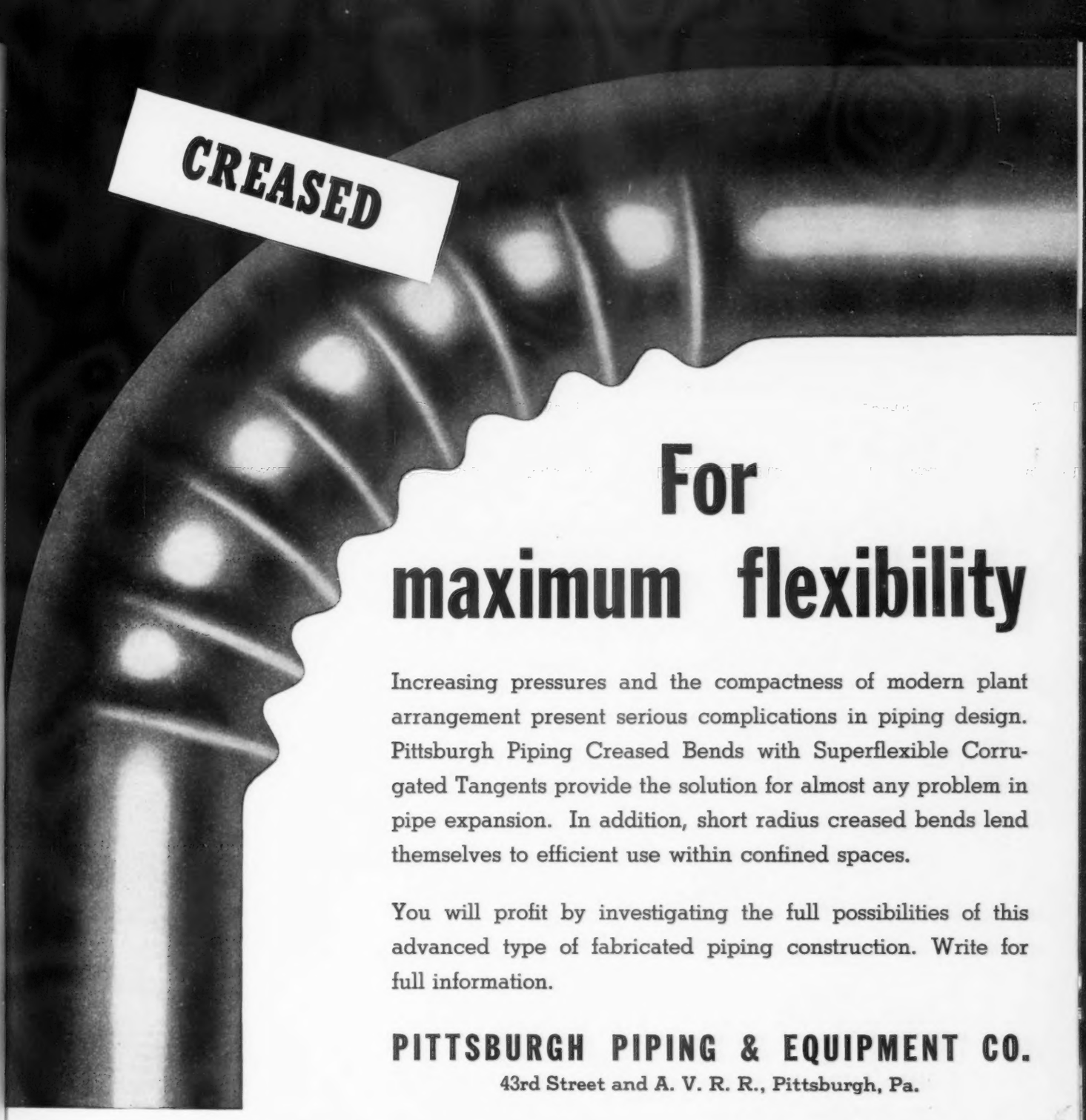
Capewell Mfg. Co., Hartford, formerly known as Capewell Horse Nail Co., has removed plant of Fowler & Union Horse Nail Co., 1000 Military Road, Buffalo, recently acquired, to Hartford works, where production will be concentrated. Buffalo plant will be closed.

WASHINGTON DIST.

Purchasing and Contracting Officer, Holabird Quartermaster Depot, Baltimore, asks bids until June 24 for 216 items of shop equipment, including nipples, couplings, tees, bushings, wire, switches, fuses, etc. (Circular 169).

Reid-Avery Co., Broad Street Station Building, Philadelphia, manufacturer of welding rods, welding wire, etc., will take bids soon for one-story addition to plant at 2324 Chesapeake Avenue, Baltimore, 100 x 120 ft. Cost over $50,000 with equipment. Carson & Carson, Commercial Trust Building, Philadelphia, are engineers.

General Purchasing Officer, Panama Canal, Washington, asks bids until June 22 for one 36-in. motor-driven bandsaw, one motor-driven variety saw and bench, five pneumatic riveting hammers, 17 pneu-



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United States Engineer Office, Navy Building, Washington, asks bids until June 23 for one motor-driven rotary vacuum pumping unit (Circular 93), for 40 miles of copper-covered steel telephone wire (Circular 95).

Norfolk & Western Railway Co., N. & W. Building, Roanoke, Va., asks bids until June 24 for requirements of couplers and parts for period from July 1 to Sept. 30 (Contract Serial AA-679).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until June 23 for two metal gun sprayers for Annapolis, Md., Navy Yard (Schedule 8198); 56,000 lb. carbon electrodes for Washington yard (Schedule 8162); four electric power plants (Schedule 8117), 12 metal gun sprayers (Schedule 8199), turbine-driven pumping units (Schedule 8018); until June 26, welding rods (Schedule 8137), insulated electric cable (Schedule 8058) for Eastern and Western yards; 1350 bronze castings for Newport, R. I., yard (Schedule 8124).

Contracting Officer, Office of Chief of Engineers, Munitions Building, Washington, asks bids until June 22 for one fireless, 3½-ton, 36-in. gage, steam storage locomotive (Circular 41).

SOUTH ATLANTIC

Cudahy Packing Co., 221 North La Salle Street, Chicago, meat packer, has let general contract to Fiske-Carter Construction Co., Spartanburg, S. C., for new plant on large tract recently acquired at Albany, Ga., comprising main one and two-story unit, 125 x 430 ft., power house, machine shop and other buildings. Cost close to $500,000 with equipment. H. J. Byrnes, company plant, Omaha, Neb., is engineer.

Contracting Officer, Quartermaster Corps, Fort Benning, Ga., asks bids until June 23 for 105,600 ft. bare copper wire, strand wire, bolts, sleeves, four post hole shovels, tamping and digging bars, and other equipment (Circular 135).

Columbus Iron Works Co., Columbus, Ga., has plans for one-story addition, 50 x 100 ft., primarily for storage and distribution.

Bureau of Yards and Docks, Navy Department, Washington, asks bids until June 24 for gas burners and accessories for boilers at power plant at Naval Air Station, Pensacola, Fla. (Specifications 8196); also bids (no closing date stated) for one 400-hp. watertube boiler with forced and induced draft fans and auxiliary equipment, same station (Specifications 8249).

OHIO AND INDIANA

Packard Electric Corp., Warren, Ohio, manufacturer of electric cables and wire, has asked bids on general contract for one-story addition, about 50,000 sq. ft. floor space, and improvements in present plant. Cost close to $175,000, of which over $80,000 will be expended for new machinery and modernizing certain present equipment. Company is a subsidiary of General Motors Corp.

George H. Frederick Distilleries, Inc., Cincinnati, George H. Frederick, 4749 Glenway Avenue, president, lately organized, is arranging financing totaling about $250,000, entire proceeds to be used for erection of new distillery in Dearborn County, Ind., near Harrison, Ohio, where large tract was recently selected. Plant will comprise several one and multi-story units, with power house, machine shop and other mechanical departments.

Village Council, Newton Falls, Ohio, has authorized plans and early call for bids for new municipal electric light and power plant. Cost about $170,000 with equipment.

Penn-Maryland Corp., 7818 Anthony Wayne Avenue, Cincinnati, has acquired 14-acre tract near distilling plant for expansion. Plans have been completed for initial unit, comprising eight-story and basement addition for storage and distribution, for which general contract will be let soon. Thomas F. Brown is vice-president, in charge.

Contracting Officer, Materiel Division, Air Corps, Wright Field, Dayton, Ohio, asks bids until June 22 for four wind indicator assemblies (Circular 991), 303 generator assemblies (Circular 956); until June 23, 250 fuel relief and by-pass valve assemblies (Circular 987); until June 25, 1000 tube assemblies (Circular 959); until July 1, 350 turn indicator assemblies, 648 flight indicator assemblies, 453 controller assemblies, 40 shaft assemblies, etc. (Circular 982).

W. J. Wittekindt Brewing Co., 200 West Morgan Street, Evansville, Ind., has asked bids on general contract for five-story addition, 88 x 150 ft., and improvements in present plant. Installation will include pitching and racking room machinery, steel and wood tanks, refrigerating machinery, compressors, boiler unit and accessories, kettles, pumps, etc. Cost over $150,000 with equipment. Konrad Keil, 1215 Windsor Drive, Dayton, Ohio, is engineer.

Guide Lamp Co., Anderson, Ind., manufacturer of automobile headlights, has plans for one-story addition, 280 x 400 ft. Cost over $200,000 with machinery. F. L. Burke is president and general manager. Company is a unit of General Motors Corp.

WESTERN PA. DIST.

American Bantam Car Co., Butler, Pa., has been organized by R. S. Evans, Atlanta, and associates, who acquired plant of American Austin Car Co., Butler, defunct. New company will take over property at once and will remodel for production of a small type commercial delivery truck and small two-passenger pleasure car, including parts production and assembling. Mr. Evans will be president of company; Thomas L. Hibbard, vice-president, and Peter Beasley, secretary. Last noted is president of Detroit Aircraft Corp., Detroit.

Monongahela-West Penn Public Service Co., Fairmont, W. Va., has approved plans for extensions and improvements in steam-operated electric generating plant at Rivesville, W. Va. Installation will include two 10,000-hp. high-pressure boiler units and accessories, 25,000-kw. turbo-generator unit and auxiliary equipment. Power substation and switching station also will be enlarged. Contract for generator has been let to General Electric Co. and for boilers to Babcock & Wilcox Co., New York. Awards for other equipment will be made soon. Cost over $2,000,000. Sanderson & Porter, 52 William Street, New York, are consulting engineers.

MIDDLE WEST

Western Chain Products Co., 1809 West Belmont Avenue, Chicago, manufacturer of automobile tire chains, etc., will take bids at once for one-story and basement addition, 70 x 90 ft. Cost about $50,000 with equipment. Edward H. Nordlie, 4825 North California Avenue, is architect.

Electro-Motive Corp., LaGrange, Ill., manufacturer of diesel engine-powered railway equipment, parts, etc., has let general contract to Austin Co., Cleveland, for one-story addition, 44 x 240 ft., primarily for storage and distribution. Cost close to $100,000 with equipment.

Iowa Electric Light & Power Co., Cedar Rapids, Iowa, plans extensions and improvements in steam-operated electric generating plant at Boone, Iowa, including new equipment. Cost about $100,000 with machinery.

City Council, Rockwell City, Iowa, has called special election June 24 to vote bonds for $175,000 for new municipal electric light and power plant. Young & Stanley Engineering Co., Muscatine, Iowa, is consulting engineer.

Commanding Officer, Ordnance Department, Rock Island Arsenal, Rock Island, Ill., asks bids until June 22 for 33,700 malleable iron castings (Circular 668), 33,600 carriage bolts (Circular 669).

Gardner-Denver Co., Williamson Street, Quincy, Ill., manufacturer of rock drills, drilling engines, pumping machinery, etc., has plans for new one-story foundry, 90 x 340 ft., for which superstructure will begin soon. Cost close to $150,000 with equipment. Frank D. Chase, Inc., 307 North Michigan Avenue, Chicago, is architect and engineer.

Boulder Minerals Corp., Boulder, Colo., A. A. Zangara, president, has plans for new ore reduction mill near mining properties about 5 miles from Boulder, including flotation, roasting and cyanide departments. Work is scheduled to begin this month. Cost about $175,000 with machinery.

Joseph Schlitz Brewing Co., Milwaukee, will take bids soon for construction and equipment of additions to malting plant to cost about $400,000.

Richland Center, Wis., City Council has voted in favor of $50,000 municipal power plant enlargement, requiring one 1250-kw. turbo-generator and a 2000 sq. ft. surface condenser unit. Installation is to be completed by Sept. 15.

Uecker Equipment Co., 1217 North Seventy-first Street, Wauwatosa, Milwaukee, which recently engaged in manufacturing new type of all-steel tubular scaffolding, has made manufacturing agreement with James Mfg. Co., Fort Atkinson, Wis., due to heavy demand and pending enlargement of Milwaukee production unit during winter and spring of 1937.

Gillette Rubber Co., Eau Claire, Wis., has placed general contract with Hoeppner-Bartlett Co., local builder, for second-story addition, 200 x 600 ft., to main tire factory, and extension to Banbury shop, 50 x 130 ft.

MICHIGAN DISTRICT

Buick Motor Co., Flint, Mich., plans two-story addition, 150 x 150 ft., including new crane runway. Cost over $100,000 with equipment.

Evans Products Co., Union Guarantee Building, Detroit, manufacturer of auto loaders, etc., has acquired plant and business of Nichols-Lintern Co., 7960 Lorain Avenue, Cleveland, manufacturer of ventilating, heating and air-conditioning equipment for automobiles. A subsidiary has been organized under name of N-L Ventilation - Heating Division of Evans Products, Inc., to operate acquired property. Plant will be removed to Detroit, where increased facilities will be provided and production concentrated. E. S. Evans is president.

Fisher Body Corp., General Motors Building, Detroit, has let general contract to H. G. Christman Co., Lansing, Mich., for two one-story additions to Lansing plant, totaling about 40,000 sq. ft. floor space, primarily for storage and distribution. Space now used for such purpose in present works will be equipped for increased production. Cost over $90,000 with equipment.

Reo Motor Car Co., Lansing, Mich., will make alterations and improvements in plant and equipment for increased production of commercial vehicles and trucks, including parts manufacture and assembling. Truck chassis production will be concentrated in main plant and additional equipment provided. R. A. DeVileg is vice-president in charge of production.

SOUTH CENTRAL

Fischer & McGee, Inc., Williamstown, Ky., care of H. A. Churchill & Associates, Citizens' Trust Building, Lexington, Ky., architects, has plans for five-story distillery and several one-story units at first noted place, with four-story storage and distributing building. Cost over $100,000 with equipment. Architects noted are in charge.

Board of Aldermen, Houma, La., asks bids until June 24 for extensions in municipal electric power plant, including new diesel engine-generating unit and auxiliary equipment.

Director of Purchases, Tennessee Valley Authority, Knoxville, Tenn., asks bids until June 23 for steel towers for transmission line from Chickamauga Dam to Watts Bar Dam.

Rodessa Oil & Refining Co., Shreveport, La., plans addition to oil refinery at Cedar Grove, near Shreveport, including new vapor-recovery machinery, distillation apparatus and other equipment. Cost close

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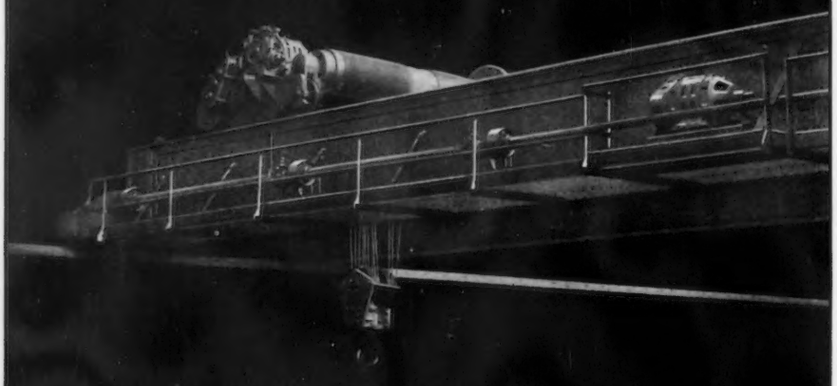

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to $80,000 with machinery. M. J. Grogan is president.

Frankfort Distillery, Inc., Columbia Building, Louisville, has plans for new 10-story storage and distributing building at plant on Dixie Highway. Cost close to $100,000 with equipment. Carl J. Epping, 806 East Broadway, is architect.

Office of Superintendent of Maintenance, Inland Waterways, 211 Camp Street, New Orleans, asks bids until June 25 for one set twin vertical reciprocating steam engines, 1500 hp., marine type.

SOUTHWEST

Monsanto Chemical Co., 1700 South Second Street, St. Louis, has engaged Stone & Webster Engineering Corp., Boston, consulting engineers, to prepare plans for addition to power house at plant at Monsanto, Ill., to include installation of two new high-pressure boiler units, each with capacity of 100,000 lb. steam per hour, chain grate stokers, pumping machinery and auxiliary equipment. Cost over $500,000.

Phillips Petroleum Co., Bartlesville, Okla., plans addition to gasoline refinery at Oklahoma City, including new equipment. Cost over $150,000 with machinery.

Common Council, Plattsburg, Mo., plans new municipal electric light and power plant. Cost about $85,000 with equipment. E. T. Archer & Co., New England Building, Kansas City, Mo., are consulting engineers.

Board of Public Utilities, City Hall, Kansas City, Kan., asks bids until July 1 for new high-pressure boiler units and auxiliary equipment for municipal electric power plant; also until July 8 for 30,000-kw. turbo-generator unit, surface condenser of 40,000 sq. ft. capacity and accessories. Entire project will cost over $1,000,000. Burns & McDonnell Engineering Co., 107 West Linwood Boulevard, Kansas City, Mo., is consulting engineer.

Magnolia Petroleum Co., Dallas, Tex., has approved plans for extensions and improvements in oil refinery at Beaumont, Tex. Work will include new by-products units for dewaxing and other petroleum processing. Award for lubricating oil treatment units has been made to Lummus Co., 50 Church Street, New York. Entire project will cost close to $1,000,000 with equipment. Company is affiliated with Socony-Vacuum Oil Co., Inc., New York.

City Council, Georgetown, Tex., has called special election June 23, to approve bonds for $60,000 for extensions in municipal electric power plant, including new diesel engine and auxiliary equipment. Burns & McDonnell Engineering Co., 107 West Linwood Boulevard, Kansas City, Mo., is consulting engineer.

PACIFIC COAST

Muscat Cooperative Winery Association, Kingsburg, Cal., C. W. Tremper, in charge, has let general contract to Trewhitt-Shields & Fisher, Inc., Pacific Southwest Building, Fresno, Cal., for addition to winery. Cost about $100,000 with fermenting, pressing, conveying, loading and other equipment. H. R. Lake, Pacific Southwest Building, Fresno, is architect.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until June 26 for one motor-driven drilling and tapping machine (Schedule 8128), one motor-driven rotary shear (Schedule 8139), one hydraulic arbor press (Schedule 8144) for San Diego Naval Station; 20,765 steel boiler tubes (Schedule 8133) for Mare Island and Puget Sound Navy yards.

Cammarano Brothers, 2316 A Street, Tacoma, Wash., liquor and beverage distributors, have plans for new two-story bottling, storage and distributing plant, 100 x 150 ft. Cost close to $75,000 with equipment. Russell, Lance & Muri, 319 South Seventh Street, are architects.

Chevrolet Motor Co., Foothill Boulevard and Sixty-ninth Avenue, Oakland, Cal., has purchased former local plant of Durant Automobile Co. and will remodel, primarily for parts production and assembling for motor trucks. This will make five plants for company at Oakland for Pacific Coast trade. Headquarters are at Detroit.

Del Rio Winery, Woodbridge, Cal., has let general contract to W. E. Lyons, 2009 Pacific Avenue, Alameda, Cal., for new plant, consisting of one-story units for main distillery, fermenting building, storage and distributing, power house, etc. Cost about $140,000 with equipment. E. G. Ernst, 9 West Cleveland Street, Stockton, Cal., is architect.

Brown Metal Works, Inc., 404 East Sprague Street, Spokane, Wash., manufacturer of metal specialties, is considering new one-story plant. Cost close to $40,000 with equipment.

General Fixture Co., 3051 Rosslyn Street, Los Angeles, manufacturer of store fixtures and equipment, has plans for new one-story plant, 60 x 140 ft., with one-story extension, 20 x 60 ft., for storage and distribution. Cost about $35,000 with equipment. Grant & Bruner, Ferguson Building, are architects.

Fallon Irrigation District, Fallon, Nev., has authorized surveys and estimates of cost for securing power supply for district, including Diesel engine-generating station near Lahontan, Nev., and installation of hydroelectric generating plant on Truckee Canal for service during certain seasons. Preliminary estimates total over $150,000 with transmission lines. George B. Scheer, 2967 Piedmont Avenue, Berkeley, Cal., is consulting engineer.

FOREIGN

Ministry of Industry, Government of Union of South Africa, Cape Town, South Africa, is at head of project to erect a new pulp and paper mill in Eastern Transvaal district, to be built and operated by private interests through Government financing. Plant will consist of several large units for kraft pulp and paper manufacture, with power plant, pumping station, machine shop and other departments. Timber properties will also be developed for pulp wood supply in same territory, with installation of sawmills and other facilities for such purpose. Plant is scheduled for completion in next 12 to 18 months. Cost over $1,700,000 with equipment.

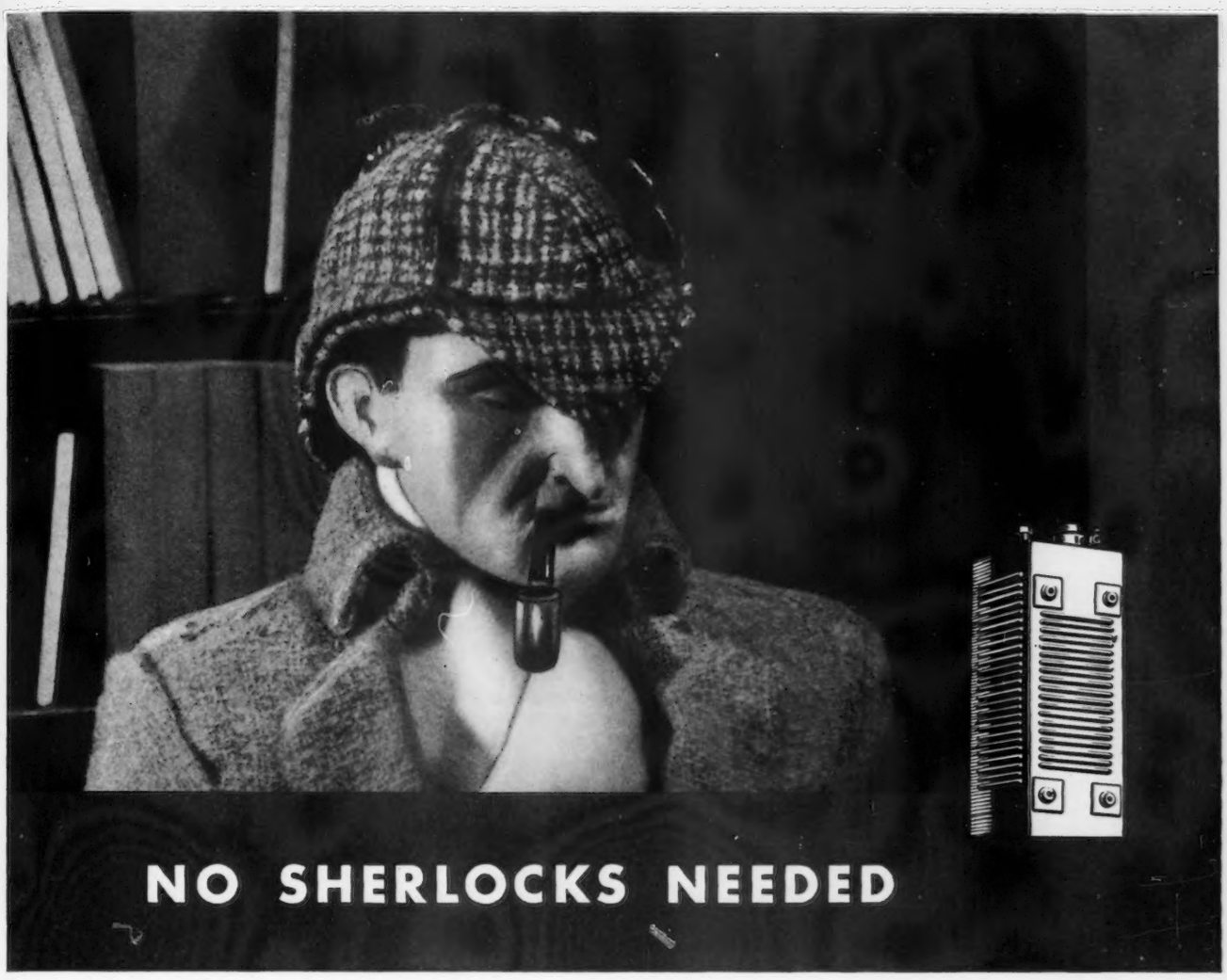
Petroleos de Mexico, S. A. (Petromex), Tampico, Mexico, has approved plans for expansion in local oil refinery, including installation of cracking machinery of Dubbs type for gasoline production. Additional storage and distributing facilities will be installed. Cost over $400,000 with equipment.

Coventry Gauge & Tool Co., Coventry, England, manufacturer of precision equipment, has approved plans for new one-story plant, for which superstructure will begin soon. Cost close to $100,000 with machinery.

Brisbane City Council, Brisbane, Queensland, Australia, asks bids until July 3 for new steam power plant, including two steam-generating units, complete with superheaters, air heaters, fuel economizers, draft plant, chain grate stokers, furnaces and accessory equipment.

Austin Motor Co., Ltd., Birmingham, England, manufacturer of automobiles and parts, plans addition for aircraft manufacture, primarily military planes for Government. Cost close to $500,000 with equipment for parts production, frames and assembling.

Ontario Paper Co., Ltd., Thorold, Ont., manufacturer of newsprint stocks, has let contract to Dominion Bridge Co., Ltd., Toronto, for plant units for new pulp and paper mill in Comeau Bay district, about 200 miles north of Quebec, where new townsite will also be constructed. Entire project will cost close to $7,500,000 with machinery.



Photograph courtesy of Ticonderoga Pencils

The steel industry understands all about the advantages of a steel storage battery for industrial truck and tractor work. No Sherlocks are needed because the facts are obvious. Steel batteries last 2 to 5 times longer than ordinary batteries, because steel is durable. They are less subject to damage, because steel is tough. They require less maintenance, because their alkaline electrolyte is a preservative of steel. In other words, they supply the very qualities required for heavy-duty service. ● Foremost, however, is the fact that Edison Storage Batteries do the work expected of them with minimum danger of unexpected failure. Such failure could cause thousands of dollars in delayed production. That more than 70% of the heavy-duty batteries in the steel industry are Edisons, shows that steel men regard them as outstanding examples of the suitability of steel where ruggedness, light weight, and dependability are needed.

EDISON STORAGE BATTERY

DIVISION OF THOMAS A. EDISON, INC., WEST ORANGE, NEW JERSEY

GERMANY

. . . German industry realizes huge saving by abolition of strikes.

o o o

. . . Deficit for 1932 has been converted into surplus.

HAMBURG, June 2 *(by special correspondence).* — It is estimated that more than 72,000,000 marks have been saved by German industry in the past two years by the elimination of lockouts and strikes. In the same period the workers themselves have saved about 160,000,000 marks. Union payments have not been reduced, however, even though these dues were used to keep up the workers during strike periods. Now the funds are employed to finance holiday excursions and after-hours entertainment.

The workmen's entertainment institution is developing as the fourth largest purchaser from the industry, ranking close behind the post office in orders. At the present time the organization owns four ocean-going ships, has three under construction and 30 more planned. Boarding houses and hotels are being constructed. Full board for only 2 marks daily is obtainable by workers at the three large seabathing resorts being built. Hospitals and theatres are also being financed by contributions to the union's funds. The shipbuilding work alone has accounted for orders for 18,000 tons of steel and steel products.

A substantial part of the public building construction program, particularly motor cars, railroads and land recuperation schemes at the sea, are financed by the considerable surplus of the unemployment insurance plan. The heavy deficit of over 220,000,000 marks monthly in 1932 has turned into a surplus of 30,000,000 to 40,000,000 marks monthly due to a rise in employment by nearly 6,000,000 and a decrease in unemployment of 5,000,000, with payment of unemployment contributions continuing unaltered.

The German Mannesmann tube works, which owns a fair share of the British Mannesmann tube works, has agreed to the purchase of the British organization by United Tube Co. This transaction ends a keen competition and will contribute toward stabilization of steel tube export prices. The heavy export movement of steel tubes is continuing, with the export figure of the first four months of this year 107 per cent better than last year.

The boom in the German motor car industry continues. Registration of all motor vehicles in April was 46,700, the highest ever recorded. In spite of the fact that government taxes on motor cars and motorcycles have been abolished since April 1, 1933, the income from motor taxes has not declined, since the number of buses, tractors and trucks which still pay taxes has increased so heavily that the amount paid by these vehicles is 95 per cent of the total paid by all motor vehicles in 1933.

Negotiations are under way between German steel works and the Italian Government for steel and machinery supplies on credit for developments in Abyssinia. This particularly applies to railroad construction and machinery for mining and road building. The Italian industry is unable to undertake the provision of such supplies alone and since the German industry is the only European non-sanctionist industry capable of such a program, it naturally gets the preference. The German industry would be willing to take Abyssinian products in part payment.

General export demand for steel products is more quiet, but substantial business is still being booked, mostly on a compensation basis. Prices are remarkably firm. Swedish export prices were advanced for the third time within a year.

The employees of Sharon Steel Corp. at the Sharon, Pa., and Lowellville and Warren, Ohio, plants will be granted vacations with pay during the current year, according to Henry A. Roemer, president and chairman. Vacations will be allowed to employees having one year or more continuous service prior to June 1, 1936. No payments, however, will be made in lieu of a vacation.

Metallizing Co. of America, New York, Chicago and Los Angeles, has available two 16-mm. motion picture films descriptive of metallizing practices. These films are available to those who would like to make use of them.

With the recently completed addition to its Dubois Street and Horton Avenue, Detroit, plant, the Micromatic Hone Corp. has doubled its manufacturing floor space. A new honing tool for automobile cylinder bores and a line of full automatic honing equipment for roller bearing races have been announced. Herbert J. Woodall has been elected to the board of directors.

THE country's widest continuous strip mill in action. Six of the four-high finishing stands of Great Lakes Steel Corp.'s new 96-in. hot mill were recently put into operation at the Ecorse, Mich., plant.